

Redesigning Internal Audit Practices in South Africa
**Understanding the influence of intelligent automation technology on internal
audit practices**

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ABSTRACT

Intelligent automation technology has shifted how knowledge workers in the service industry work, as many manual tasks can now be automated. In particular, the influence of intelligent automation technology, defined as robotic process analysis, artificial intelligence, and machine learning, was perceived to have changed how internal audit practices are performed. This perceived change would have resulted in redesigned business processes which would have shifted how customers are serviced, how services are provided, the way in which the internal audit function operates, as well as the organisational structure, use of technology and business information to create a competitive advantage. Therefore, from a South African context, the research aimed to understand how intelligent automation technology influenced the redesign of internal audit practices in South Africa, taking into consideration critical success factors and barriers experienced, with the purpose of being able to leverage change implementation and redesign practices for knowledge workers in the service industry.

A qualitative, exploratory research methodology was used to gain insight into perceived changes in internal audit practices due to the influence of intelligent automation technology and the success factors and barriers experienced during the change. The study consisted of 16 semi-structured, in-depth interviews with Senior Managers and Chief Audit Executives from in-house internal audit functions as well as Director and Partner level internal audit professionals from professional service firms. The key finding of the research study indicated that due to the influence of intelligent automation technology, internal audit practices in South Africa have been slow to redesign business processes and, in some instances, have not fundamentally redesigned internal audit practices. The study provided insight into the business process redesign framework used to underpin this study, which revealed that although effective in providing consideration when implementing a change programme, the South African environment is unique and without adequate due diligence processes to evaluate the organisational, social and technology landscape of the business environment in which change is to be implemented, BPR will not be successful and as such internal audit practices have seen limited changes.

KEYWORDS

Internal Audit, Intelligent Automation Technology, Change Management, Business Process Redesign and South Africa

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Subhadra Ragubeer

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1 CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1 Chapter introduction

This chapter introduces the research problem as well as the context in which this research problem was studied. The purpose of the research, which is undertaken through an academic and business lens, is then provided, together with the devised research questions, scope, significance, limitations, and research design.

1.2 Definition of the research problem

Technical advancement and innovation are driving forces behind business transformation (Lehmann & Thor, 2020; Nwaiwu, 2018). The business environment has increasingly become digitised, with new technologies being integrated into private and business lives through the increased use of mobile devices, operating systems, applications, and software tools (Bhimani & Willcocks, 2014; Fusko et al., 2020). With increased connection via the Internet of Things (IoT), the world itself is becoming an information system (Arnold, 2018; Brennan et al., 2019; Chui et al., 2010) hence, lending itself to the development of Intelligent Automation Technology (IAT) where over time tasks that were formally undertaken by humans can be automated (Coombs et al., 2020; Ng et al., 2021).

With this changing reality, Xiaohong & Ling (2019) suggests that greater turmoil has been added to business, the unpredictability and turbulence experienced through the fourth industrial revolution, together with macro-economic factors such as climate change and global economic, political, and social changes, gives rise to a VUCA world that includes high levels of “volatility, uncertainty, complexity and ambiguity” (Schoemaker et al., 2018, p.16). As such, Ahmed et al. (2022) describe the impact on businesses being in a state of constant change, which presents challenges and opportunities.

As such, intelligent automation technology such as Artificial Intelligence (AI), Machine Learning (ML) and Robotic Process Analysis (RPA) have been impacting the business and society in profound ways, such as increasing cognitive ability to process and interpret data, thereby creating strategic and competitive opportunities (Battina, 2020) as well as increased management of the business and environmental risks (Xiaohong & Ling, 2019). Coombs et al. (2020) argues that intelligent

automation has created opportunities for manual tasks that are routine and repetitive to be automated, which is commonly found in knowledge and service work.

Hislop et al. (2018) define knowledge work as the creation and utilisation of knowledge which is intellectual in nature and often found in consulting professions. Corporate governance, which is deemed as knowledge work due to the decision-making process required (Pratiwi & Chariri, 2021), means that a VUCA world has led to an increase in emerging risks where a strong pillar of corporate governance through independent assurance is required (Cheng & Foo, 2016; Wibowo et al., 2021).

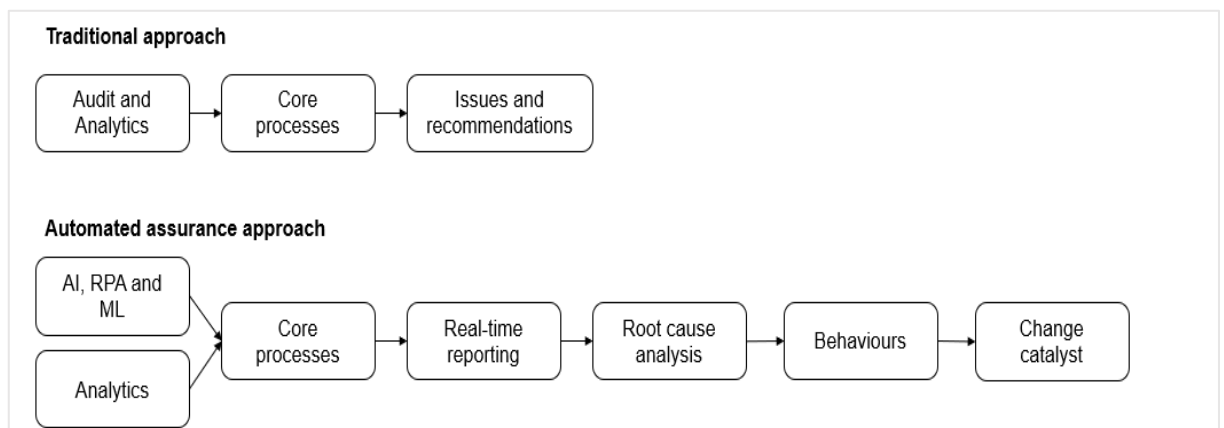
Empirical research supports the concept that good corporate governance and the effective operations of an organisation can be attributed to the importance of internal audit activities as independent assurance providers, however, manual-based operations of internal audit functions (IAFs) can be inefficient, less effective and more costly, with internal audit budgets often being substantial and, if not adequately structured, can result in insufficient audit procedures, thereby weakening the internal control environment of a business (Barac et al., 2009; Eze, 2016; Liu, 2017; Newman & Comfort, 2018). Therefore, intelligent automation can serve as fundamental building blocks for internal audit functions deemed as knowledge workers (Ramamoorti, 2003) to aid business opportunities presented by a VUCA world by being a value-adding activity.

Eulerich & Eulerich (2020) indicated that to be a value-adding activity, internal audit functions have transformed into a 'special role' due to the increased importance of automation. Additionally, a more significant impact and development of expert human auditors, as the focus is on the use of technology in providing independent assurance, is noted (Brennan et al., 2019; Brown-Liburd et al., 2015). Coombs et al. (2020) argues that intelligent automation technology can be adopted to automate work tasks that would provide greater precision, thereby reducing errors and enabling the completion of tasks more efficiently compared to manual human processes. This sentiment is supported by Arnold (2018), who argues that technology has fundamentally changed how assurance is provided through audit practices and methodologies being applied, with this change being called the "next wave of automated audit" (p.323).

With this in mind, Deloitte (2018b) did a comparative study, as reflected in Figure 1 below, on the difference intelligent automation has had on the approach assurance providers use to perform audits, where traditionally, i.e., before the use of technology, audits were performed through core processes to identify issues and provide recommendations. Whereas post the introduction of technology, automated assurance is led through intelligent automation, where the core process provides real-time reporting of results that include a root cause analysis and associated behaviours to be a change catalyst (Deloitte, 2018b). This significantly contributes to the fact that there has been a notable change in the way internal audit activities are being performed (Christ et al., 2021) due to the influence of IAT, which is illustrated in the diagram below.

Figure 1

Traditional Assurance Versus Automated Core Assurance



Source: Deloitte (2018b)

Supported by Christ et al. (2021), where in the same way internal audit functions are found to be in use of various data sources, digital processes and technological tools to provide assurance, empirical studies have confirmed that internal audit practices and functions have evolved to include Robotic Process Automation (RPA), Predictive Analysis (PA), Data Analytics (DA), Artificial Intelligence (AI) and Machine Learning (ML) (Deloitte, 2020; EY, 2021b) which falls under the umbrella of Intelligent Automation Technology (IAT) (Coombs et al., 2020). Furthermore, Pizzi et al. (2021) performed a bibliometric study assessing the impacts of digital transformation on internal auditing and found that data analysis has changed the internal audit profession with the identification of new audit activities.

However, at a micro-process level, there is a lack of practical research on internal audit processes where the impacts of IT and the redesign of processes need to be understood (Behrend & Eulerich, 2019; Betti & Sarens, 2021). Roussy and Perron (2018) explain that internal audit research on how technology has changed the profession is “far from comprehensive” (p. 345), and with there being a lack of global research studying internal auditing, future research should focus on the transformation of the internal audit process due to the use of automation and how this change has occurred (Behrend & Eulerich, 2019; Christ et al., 2021; Roussy & Perron, 2018). Furthermore, through a study conducted on the risks of intelligent automation and the impact on internal audit by Kovanen (2020), an area for future research included understanding how internal audit has used intelligent automation in their own operation based on a specific location.

Additionally, due to intelligent automation for knowledge and service work being a new topic, the research agenda, as explained by Coombs et al. (2020), requires further exploration. Similarly, Ng et al. (2021) provided a holistic literature review of intelligent automation applications, however, to further develop the body of knowledge, intelligent automation in business domains such as finance and accounting where customer experiences through supportive services should be undertaken. Additionally, in change management programmes, redesign, and the improvement of processes to gain a competitive advantage are based on success factors and upfront identification of barriers (Harmon, 2019; Javidroozi et al., 2019; Jurisch et al., 2014)

Therefore, as the internal audit profession is based on knowledge workers providing corporate governance support to businesses where emerging risks and opportunities due to intelligent automation are noted, the need for the focus of the current study is on understanding how the influence of intelligent automation technology has changed internal audit practices, as well as the identified success factors and barriers experienced, is highlighted.

1.3 Context of the study

South Africa is a unique country, whereby post-apartheid significant social development has occurred, however with still many factors impacting economic development and growth, such as a high unemployment rate, increasing inequality and poor service delivery (Schneider, 2018). Moreover, corporate failures such as fraud, corruption, and unethical behaviour cause mistrust in businesses in South Africa (Brewis, 2021), resulting in an increased focus on the requirements of the King IV Report on corporate governance for businesses to adopt and execute (Institute of Directors South Africa, n.d.).

Internal audit, as a pillar of corporate governance, is hence a unique profession in South Africa that has an elevated level of competencies due to the requirements of King IV on corporate governance compared to the rest of the world, as well as the macro-economic conditions of the country and the increased regulatory conditions of business (Coetzee et al., 2015). Therefore, the uniqueness of internal audit in South Africa was key in furthering the body of knowledge of internal audit redesign and was, therefore, the contextual focus of this research study.

1.4 Research purpose

The purpose of the research was to understand how intelligent automation technology influenced the redesign of internal audit practices in South Africa in order to be able to leverage change implementation and design practices for knowledge workers in the service industry. To date, empirical studies concerning the critical success factors in the form of best practices used as well as barriers experienced during the implementation of a redesign programme in the internal audit fraternity, remain scarce.

Behrend & Eulerich (2019) pronounced that the change in internal audit practices is required to be studied in greater detail, whilst Christ et al. (2021) detailed the changes experienced due to intelligent automation, however, with limited knowledge of the process experienced during the change process. Coombs et al. (2020) provides a guideline on the strategic impacts of intelligent automation for knowledge workers in a service industry, however, how this has influenced internal audit practices in South Africa and what changes have been experienced due to IAT is unknown. Therefore,

the purpose of this research is to close the gap between expectations of the rate of change in internal audit practices based on intelligent automated technology and how this change has occurred in a South African context which includes success factors associated with change as well as barriers experienced.

Therefore, from a theoretical perspective, this study aimed to build on existing literature on change implementation due to intelligent automation for knowledge workers, specifically the internal audit profession in a service industry, which will contribute to closing the gap where literature is lacking in internal audit practice development due to IAT. The theoretical lens through which this study was conducted is through Business Process Redesign (BPR), as it is seen as a successful way to respond to the changes in a business environment (Mansar & Reijers, 2007). BPR refers to improvement programmes based on understanding the “as-is” processes to “to-be” processes, which means an existing process is taken as-is and, by applying various best practices, is slowly refined, or improved to the desired state (Mansar & Reijers, 2007; Vizzon et al., 2020). Hence, the purpose of the theoretical lens through which internal audit has been redesigned based on IAT could be identified through business process redesign.

It is important to note that although the study successfully determined the rate of change of internal audit practices in South Africa due to IAT, the full extent of BPR implementation was yet to be experienced or observed by the research participants. The study, therefore, revealed that in a South African context, there are high barriers to implementing technology in a support function such as an internal audit function.

Therefore, although some elements of BPR could be established, the uniqueness of the South African environment illustrates that an additional step to change management implementation is required, which is the performance of BPR due diligence processes which is conducted at the feasibility stages of BPR implementation. The required due diligence process includes a macro-economic and micro-economic environmental review to ascertain if IAT adoption will be feasible from a skill and access to technology perspective, which feeds into the performance of a financial and non-financial due diligence process which is explained in greater detail in the conceptual model adapted to the BPR framework for a South African environment in Chapter seven.

1.5 Research questions

Based on the research problem and purpose, the research study aimed to explore how intelligent automation technology influenced the redesign of internal audit practices in South Africa, taking into consideration critical success factors and barriers experienced, with the purpose of being able to leverage change implementation and redesign practices for knowledge workers in the service industry.

To accomplish this aim, the main research question, which is supported by the sub-research question, was set out as follows:

Main question: How has the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa?

Sub-question 1: Which critical internal audit practices were redesigned to save on time and cost but increase quality and flexibility?

Sub-question 2: What factors were considered successful in redesigning internal audit practices?

Sub-question 3: What factors were considered barriers to redesigning internal audit practices?

The aim of the research was to further support assurance providers that are embarking on redesigning a 'to-be' process due to the influence of IAT or who are currently undergoing change management and redesign programmes by providing a framework for critical internal audit practices that are to be considered in redesigning internal audit practices in South Africa, together with the success factors to be used and barriers to be aware of that might hinder the successful implementation of a change programme.

The research served to benefit other support functions that offer business support through knowledge workers in the service industry where the principles of BPR implementation in South Africa can be leveraged, which was also presented as part of this study.

1.6 Scope of the research

Intelligent automation technology and change management practices considered under BPR are typically studied in manufacturing industries (Gross et al., 2020; Ng et al., 2021), however, the increased adoption of IAT in knowledge workers in service industries, proves to be critical in strategic impacts of business performance (Coombs et al., 2020). Therefore, the scope of the research study was limited to knowledge workers, more specifically to internal audit professionals who are classified as knowledge workers, who are part of an internal audit function in the service industry in South Africa.

1.7 Significance of the research

From an academic perspective, the research aimed to fill a gap in the current academic literature with regard to determining how intelligent automation technology influenced the redesign of internal audit practices in South Africa. Critical success factors in the form of best practices used, as well as barriers in the implementation of a redesign programme in the internal audit fraternity, were studied, with the aim of providing practical insights when internal audit functions embark on a change management programme.

The study proved to be informative as the expected change in internal audit, as suggested by the literature, was not experienced to its full extent in a South African environment. Abhishek and Divyashree (2019) indicated that the future of auditing functions includes the insertion of robotics, and even though awareness of IAT is present, the implementation is still lagging, which confirms the findings of the study. Therefore, barriers *in* implementation were discussed as opposed to barriers *to* implementation, which highlighted a significant step that is to be included in BPR change management practices in South Africa.

From a business perspective, the aim of the study was to offer a greater understanding of critical processes that have been redesigned by internal audit practices due to the influence of intelligent automation technology and the support required to adapt, transform, and change with business so that business can better leverage support functions to provide greater insights and more resounding support in risk and opportunity management.

1.8 Research limitations

The current study was an exploratory, qualitative research study where the phenomena of redesigned internal audit practices due to the influence of intelligent automation were investigated through the lived experience of research participants. As such, the following limitations of the study must be highlighted:

- Researcher bias, and respondent bias as the researcher is an internal audit professional, and the possibility for subject bias exists in how the questions were framed.
- Generalisation of results as judgemental sampling techniques were used to select representative samples against the set criterion. It should be noted that although the aim was to select research participants across multiple industries, based on availability, all interviews were held with internal audit professionals from the South African financial services and insurance industry which means that the study might not hold true for internal audit practices in other industries or outside of South Africa.
- Credibility of the interviewees was filtered based on set criteria that included role seniority and years of experience. The researcher cannot eradicate that seniority based on the designation of the role is different per company, and years of experience indicated were not fully obtained in internal audit practices.
- Due to the interviews being held virtually, inferences based on physical queues through body language could not be identified.
- As the interviews were held at a point in time, inferences about changes in the internal audit practice post the interview cannot be made.

1.9 Research design

As the objective of the study was to explore and uncover the phenomena of changed internal audit practices and the process redesign due to the influence of intelligent automation technology, the research approach was interpretivist. The study followed an inductive, qualitative, exploratory research methodology, with data being collected through in-depth semi-structured interviews.

1.10 Outline of the research study

The structure of the research study, following the defined problem and purpose of the research in Chapter one, a literature review is contained in Chapter two, which presents an analysis of the evolution of internal audit practices, the influence of IAT and automation, and through critical success factors used in business process redesign, argues the need for a framework to aid internal audit practices that aim to redesign practices due to IAT. Chapter three presents the research questions that were used to guide this study, and Chapter four outlines the methodology used to undertake this research. Following this, the results of the research, obtained through an analysis of the interviews, are presented in Chapter five, and a discussion of the findings based on the literature review is presented in Chapter six. The research report concludes with an adapted framework for BPR implementation in a South African context for knowledge workers in a service industry and recommendations for future research in Chapter seven.

1.11 Chapter summary

This chapter has provided an overview of the research problem relating to the redesign of internal audit practices due to the influence of IAT in South Africa, the context in which the study was performed, together with the research purpose and scope, the significance of the study, limitations experienced, a brief overview of the research methodology and design and outline of the research study that is to follow in the subsequent chapters.

2 CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1 Chapter introduction

Chapter one outlined the research problem, highlighting both the academic and business rationale for the study, which is to understand how intelligent automation technology influenced the redesign of internal audit practices in South Africa and the critical success factors and barriers that are experienced in the implementation of the change.

Chapter two reviews relevant literature, including the three dimensions of the research objective which relate to the main and sub-topics as well as the key sources that are journal ranked, as indicated in Table 1 below. These dimensions are the evolution of the internal audit profession, and hence the change in internal audit practices; intelligent automation technology and the impact on internal audit; and the theory of change management through the lens of business process redesign to identify critical processes required for the evolved internal audit practice as well as barriers experienced in the implementation of such change.

As assurance activities performed in organisations do not exist in a vacuum and are influenced by the environment in which it operates, it is therefore critical to understand the context of this study, which is through the lens of the South African environment.

Table 1

Overview of the Literature Review

Main topic	Sub-topics	Key sources
Evolution of internal auditing as a profession	Definition and mandate of the internal audit profession	Albawwat et al., 2021 (AJG:1) Bäßler & Eulerich, 2022 [Unrated] Behrend & Eulerich, 2019 (AJG:2) Betti & Sarens, 2018 (AJG:2)
	The importance of the profession to business	Betti & Sarens, 2021(AJG:2) Christ et al., 2021 (AJG:3) Institute of Internal Auditors, 2022 Landers & Behrend, 2022 (AJG:4*)

Main topic	Sub-topics	Key sources
	Evolution of the internal audit profession	Pizzi et al., 2021 (AJG:1) Radwan et al., 2021 (SJR: 0.262) Roussy & Perron, 2018 (AJG:2) Savčuk, 2007 (AJG:2)
Intelligent automation technology (IAT)	The rise of IAT	Coombs, 2020 (AJG:4*)
	Definition of IAT	Coombs et al., 2020 (AJG:4*) Hislop et al., 2018 [Book]
	The perceived impact of IAT on internal audit	Kovanen, 2020 [Thesis] Lacity and Willcocks, 2021 (AJG:2)
	The impact of IAT and best practices of adoption	Ng et al., 2021 (SJR:1.601) Schwab, 2017 [Webpage]
Change management	Antecedents of change management through business process redesign	Aghimien et al., 2022 (SJR:0.565) Akinradewo et al., 2022 (SJR:0.371) Ghobakhloo et al., 2021 (AJG:2)
	Definition of BPR	Jansen-Vullers & Reijers, 2005 (AJG:1)
	BPR framework	Mansar & Reijers, 2007 (AJG:2) Moeuf et al., 2020 (AJG:3)
	Elements of BPR	Reijers & Mansar, 2005 (AJG:3)
	Critical success factors and barriers for BPR	Vizzon et al., 2020 (SJR:0.176)

2.2 Evolution of Internal Auditing as a profession

2.2.1 Definition and mandate of the Internal Audit profession

The mandate of the internal audit profession is governed by the Institute of Internal Auditors (IIA), which has defined internal auditing as an “independent, objective assurance and consulting activity designed to add value and improve an organisation’s operations” (The Institute of Internal Auditors, 2022a, para.1). Additionally, internal audit aids organisations “in accomplishing its objectives by evaluating and improving the effectiveness of risk management, control, and governance processes” (The Institute of Internal Auditors, 2022a, para.2) in a methodological and disciplined way (Coetzee et al., 2015).

The internal audit profession is guided by the International Professional Practices Framework (IPPF), which is published by the Institute of Internal Auditors and states that the internal audit function (IAF) is required to support the business environment

by changing and adjusting the internal audit plan in relation to changes occurring in the business (The Institute of Internal Auditors, 2022b). Similarly, Deloitte (2016) referred to key alignment processes with the King IV code on corporate governance processes to have an independent function, which is the internal audit function to provide an opinion over the risks and opportunities business face. In addition, Ashraf et al. (2020) indicated that the mandate of the audit committee is to ensure that an internal audit activity is independent and is able to provide objective assurance.

2.2.2 The importance of the profession to business

Barros and Marques (2022) indicated that with the growing demand for credible financial information, internal audit is seen as an increasingly important role in an organisation. García-Sánchez et al. (2021) argues that it is not only financial information that is the focus of shareholders and interested parties but also non-financial information relating to sustainability that has increased importance, where assurance should be provided by assurance providers. Therefore, the effectiveness of internal audit functions in an organisation is associated with the value-adding potential to meet stakeholder expectations and needs (Albawwat et al., 2021; Turetken et al., 2020).

Consequently, the importance of an internal audit function in business is to ensure that financial and non-financial reporting is transparent and of the quality expected by shareholders and interested parties to provide independent information to guide business decisions (Albawwat et al., 2021; García-Sánchez et al., 2021; Turetken et al., 2020). Equally, the importance of an internal audit function in business, apart from financial reporting quality, as supported by Newman and Comfort (2018), is to assist firms in improving efficiency, safeguarding against losses, and enhancing the existing business processes. Therefore, the change in business due to the influence of intelligent automation results in a change in the requirements and expectations of internal audit functions to be supportive of business processes (Christ et al., 2021; Coombs et al., 2020) and as such giving rise to the evolution of the profession.

2.2.3 Evolution of the internal audit profession

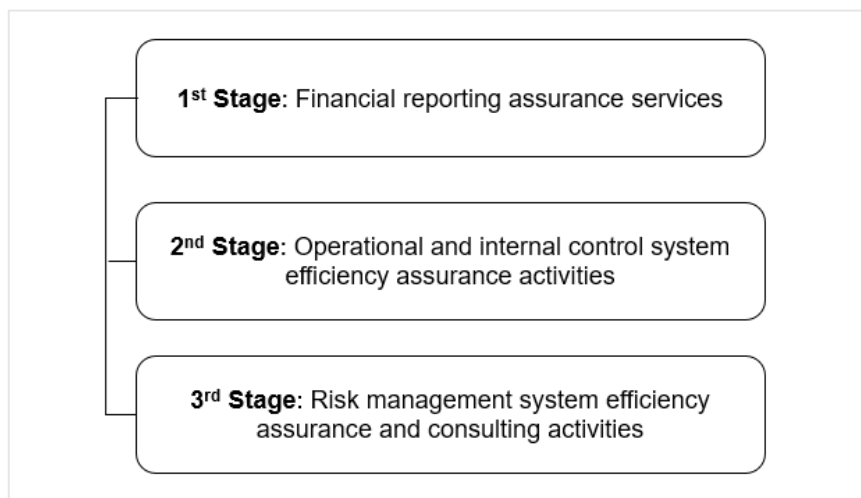
Ramamoorti (2003) indicated that as early as 1947, the first description of internal audit activities and responsibilities of an auditor was introduced, which was primarily

focused on accounting and financial aspects. A decade later, the definition of internal audit grew to include assurance over operational controls, compliance with procedures and governance over financial and non-financial processes and by 1987, the first official definition was released by the IIA (Savčuk, 2007).

In the 1990s into the 2000s, the definition grew to include consulting activities as part of the role of internal auditors and to become a proactive, customer-focused function that adds value to the risk management and governance processes of an organisation (Badara & Saidin, 2013; Barac et al., 2009; Savčuk, 2007). The evolution of internal audit is thus displayed in three stages since its inception in Figure 2, which depicts the evolution of internal audit from providing assurance over financial reporting to operational and internal controls to risk management which includes consulting activities.

Figure 2

Evolution of Internal audit activities



Source: Savčuk (2007)

In recent years, the transformation of internal audit activities includes real-time monitoring and reporting called continuous auditing, which includes data analytics and big data (Lal Joshi & Marthandan, 2020). This shift has moved the internal audit activity from not only verifying past information but to using technology and digitalisation to prevent errors in transactions and predicting future events with research commencing in early 2020 (Bäßler & Eulerich, 2022; EY, 2021a; Kuenkaikaew, 2013; Landers & Behrend, 2022).

2.3 The rise of intelligent automation technology

Schwab (2017) characterised the “Fourth Industrial Revolution” or “Industry 4.0”, which started in the early 2000s and is described as the digital revolution categorised by combining technologies that result in a fusion of “physical, digital and biological spheres” (p.2) or in short, the hybridisation of teams where machines and humans work side by side (Richert et al., 2016). The changes associated with Industry 4.0 include entire systems of operations, management models and governance structures which have led to the emergence of new challenges and opportunities and the transformation of how information owners identify, digest, and interact with new business processes (Bodrožić & Adler, 2018; Piazza & Abrahamson, 2020).

Commonly associated terms with Industry 4.0 in the modern era include digital technologies such as cyber-physical systems (CPS), cloud computing, the internet of things (IoT), big data and artificial intelligence (Fatorachian & Kazemi, 2018; Küfeoğlu et al., 2019; Oztemel & Gursev, 2018). Collectively, these terms are also known as digitisation, which in its simplest definition is the shift from traditional, analogue processes to digital solutions through the creation and use of computerised information, which is called digitalisation (Küfeoğlu et al., 2019; Pizzi et al., 2021) which gives rise to intelligent automation technology (Battina, 2020).

2.3.1 Intelligent automation technology defined

Amongst new and existing technology, intelligent automation is defined as a cluster of technologies that are changing how business operates by providing sophisticated methods in which decisions are made (Ng et al., 2021). Similarly, on a business level, IBM (2021) defines intelligent automation as cognitive automation, in which technology such as artificial intelligence (AI), machine learning (ML) and robotic process automation (RPA) is used to simplify processes, improve operational efficiencies, and generate resource capacity. Likewise, Violino (2022) explains that the benefits of intelligent automation technology are focused on automating manual tasks that would be repetitive in nature, with the aim to reduce costs, increase productivity and proactively manage errors, which is aligned with the objectives of business process redesign with aims to reduce costs, increase quality, and create flexibility (Reijers & Mansar, 2005).

Coombs (2020) argues that post the global pandemic, the need for IAT has increased due to consumers preferring IAT because of increased business confidence and familiarity with IAT concepts and technology. Such concepts of IAT, such as artificial intelligence, which Collins et al. (2021) defines as the cognitive ability of machines to interpret and manipulate data to problem solve, automatically refine, and improve results and create commands and image analysis through speech recognition, is one of the many ways in which businesses adopt artificial intelligence.

Simultaneously, under the umbrella of IAT is RPA, which, as defined by Bhosale (2019), is a cost-effective solution to automate bulk and repetitive business tasks and is closely linked to machine learning, where rules created through RPA to formulate a cognitive pathway in a machine to apply artificial intelligence. EY (2021a) and Gartner (2022) provide additional guidance on RPA, which is the use of robotics or 'bots' to automate repetitive and routine tasks through the use of self-governing computer programmes and in contrast, AI uses logic-based techniques and allows machines to learn trends and analysis to apply deeper analysis. Contrary to the benefits of IAT, Kovanen (2020) states that IAT has certain limitations, which includes only certain rule base tasks being applicable and the requirement of businesses to be automated.

Davenport and Kirby (2016) and Coombs et al. (2020) indicated that manual tasks are commonly associated with knowledge and service work, which includes cognitive tasks that IAT can imitate. Accordingly, Lacity and Willcocks (2021) suggests that becoming strategic with intelligent automation includes automating knowledge worker tasks which generates capacity for strategic insights and implementations, which result in greater business benefit.

2.3.2 The perceived impact of IAT on internal audit

As the internal audit profession is considered knowledge workers, contrary to the use of IAT solely on business processes, KPMG (2018) found that intelligent automation creates key opportunities for internal audit functions, which include the use of IAT to perform audits and from a risk and control perspective, aid business in providing governance considerations when implementing IAT as well as identify opportunities to embed IAT in business processes. However, Deloitte argues that foundational

IATs, such as data integration and analytics, are being incorporated into audit practices, whereas mature IAT such as ML and AI are still being included where internal audit processes are required to evolve and adapt with such IAT maturity.

As such, internal audit functions are also expected to adapt and change to support the business strategy as there is a confirmed direct impact between the strategy businesses set and the expectations of the IAF (Betti & Sarens, 2018). Changes in strategy by business have led to changes to internal auditing processes due to the disruptive impacts caused by technological innovation (Pizzi et al., 2021). Therefore, the most widely used digital technology by IAFs includes Robotic Process Automation (RPA) and Predictive Analysis (PA) which falls under the umbrella of Artificial Intelligence (AI) and hence IAT (Deloitte, 2018a; EY, 2021a).

The importance of IAT for assurance providers is that agile, complex, and innovative approaches are to be followed due to the increased pressures for information and governance systems at an organisational level (Brennan et al., 2019). Goos et al. (2019) argues that technological changes lead to significant job restructure, which requires a change in skills, processes, working arrangements and methods, however through a survey performed by PWC (2011), effective communication, building strong relationships with the company leadership and the capacity to engage all stakeholders are critical skills required for a changed internal audit world.

Additionally, Kovanen (2020) indicated that key challenges for internal audit to face when IAT is in use includes the role and position taken in auditing and implementing IAT adoption as well as the biggest risk being the adequacy of competencies in an internal audit team to adapt and adopt IAT effectively. On the other hand, Rawashdeh et al. (2022) differ from IAT implementation by indicating that the environment in which RPA is to be adopted by internal audit functions needs to be ready and not because it is an industry trend, but, because having a clear digital vision, strategy and objective for expected outcomes is defined.

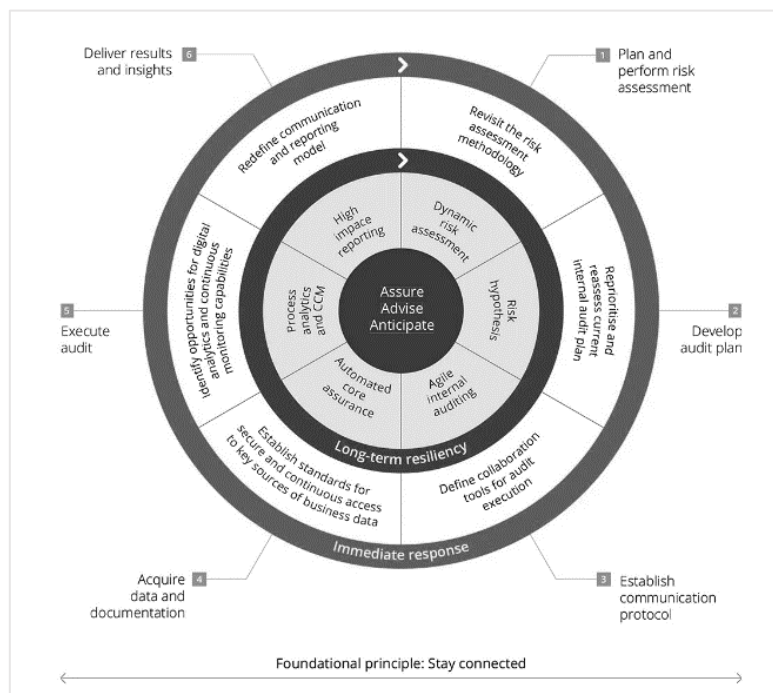
According to Raji et al. (2020), there is an accountability gap when artificial intelligence is used, and as such internal audit's role in providing algorithmic auditing is imperative for robust corporate governance in businesses. Nonnenmacher and Gómez (2021) added that with IAT, data presented to internal auditors result in

expected errors that were anticipated by the audit process, whereas the need for detection based on data where additional anomalies can be identified is essential.

Hence, a standard internal audit lifecycle which included four stages, namely, internal audit risk assessment, audit planning, audit fieldwork and reporting (Radwan et al., 2021), has now changed with the influence of IAT, meaning that the four stages of the internal audit lifecycle have expanded into six stages, with the two additional stages being establishing a communication protocol and acquiring data and documentation ahead of the fieldwork stages which is to provide for changes in the internal audit practice (Deloitte, 2020). Therefore, Deloitte (2020) has created a conceptual framework, reflected in Figure 3 below, whereby the internal audit lifecycle is recreated, highlighting in stages 4 and 5 where IAT and automated tools drive change and increase organisational resilience.

Figure 3:

Internal Audit Practice Lifecycle



Source: Deloitte (2020)

2.3.3 The impact of IAT and best practices of adoption

The impact of IAT on business includes improved ways in which customers are served, thereby raising customer expectations through enhanced products by either

value or function; increasing the speed of innovation by requiring the collaboration of data services and analytics to make informed decisions; and shifts such as organisational structure, culture, talent, and business models (Daemmrigh, 2017; Schwab, 2017). However, Hughes et al. (2022) argue that a transition into the digital world is complex with many barriers, including substantial investment, the need for adequately skilled workers and enhanced IT security protocols due to the risks presented (Mawane & Mutayavavire, n.d.; Schwab, 2017).

Therefore, Lacity and Willcocks (2021) have highlighted seven key risks in adoption where best practices were not used in the implementation and resulted in errors being experienced that included: strategy risks, where value is misunderstood; sourcing risks, where the incorrect advisors and partners were selected; tool selection risks, where the incorrect tool was sourced; stakeholder buy-in, where overpromises and under delivery is faced; inadequate project management which includes too much or too little automation, failure to create an operating model where IAT is then not fully utilised; inadequate change management and business process redesign principles which include poor people management; and maturity risks, where momentum is stalled.

The inverse of risks of IAT adoption gives rise to best practices used in IAT adoption and implementation, which, as defined by Josyula et al. (2021), includes the top five best practices in order of importance being: leadership vision on changed practices; organisational structure, which includes team structure and collaboration; programme methodology which includes business process milestones; team skills and capabilities and the agility to adopt new skills; and creating a learning and feedback culture on the IAT implementation process.

Therefore, the adoption of IAT creates change management processes that need to be considered to ensure successful implementation and adoption for knowledge workers (Coombs, 2020; Hislop et al., 2018; Kovanen, 2020), which as per this research study are internal audit professionals.

2.4 Change management

2.4.1 Antecedents of change management through BPR

Today's business environment is more demanding and competitive due to globalisation, the application of modern technology, a higher education level and the bargaining power of customers, which has resulted in organisations needing to constantly change and improve business operations (Kasim et al., 2018). Therefore, a change management programme that encapsulates the design of the future state process aligned with company objectives and performance is important (Brin et al., 2020). Hence, business process redesign (BPR) which is defined as "the most value-added phase" (p.1) aids in the improvement of business process and the attainment of company objectives and performance by understanding the 'as-is' and the desired 'to-be' state of processes (Vizzon et al., 2020).

Therefore, the theory of BPR and best practices used in BPR underpin this research study, as internal audit practices have been empirically proven to have been redesigned due to the influence of IAT. Seminal work based on the introduction of BPR by Hammer (2002) will be reviewed, with primary contributing authors being Mansar & Reijers (2005), Jansen-Vullers & Reijers (2005) and Vizzon et al. (2020) with a focus being on the BPR framework developed by Mansar & Reijers (2007).

2.4.2 Business Process Redesign defined

A business process is a group of activities organised together to create customer value (Hammer, 2002). A process is redesigned when a gap is noted between the current performance of a process and the desired performance of a process; hence BPR is known as an improvement programme of applying various processes to the present state of a process to achieve the required state (Hammer, 2002; Mansar & Reijers, 2007a; Vizzon et al., 2020).

An early definition of the objectives of redesigning processes was to reduce the time required in the process, which reduces the cost of executing tasks in the process while improving the quality of service delivered, which culminates into a flexible process that can adapt to variation (Jansen-Vullers & Reijers, 2005). In recent times, management consulting firms that focus on business process redesign have maintained the aims associated with BPR and distilled it into "improved productivity,

cycle times and quality” (Bain & Company, 2018). Riyanto et al. (2019) argues that although BPR was primarily used in manufacturing optimisation, in recent years, where customers are the focal point of a business, BPR is as relevant, which includes industries such as financial services. Therefore, the relevance of BPR in changing internal audit practices due to the influence of IAT is relevant for this research study and was conducted based on the BPR framework below.

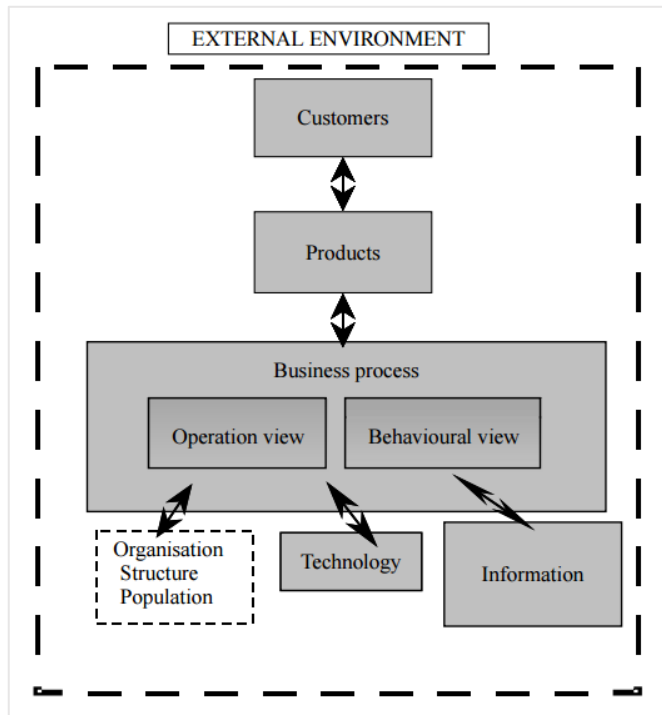
2.4.3 BPR Framework

Hammer (2007) argues that with the lack of guiding frameworks, organisations can experience adverse effects of inadequately transforming business processes, contrary to the assumptions of process redesign, meaning a rearrangement of work patterns and the sequence of how tasks are performed, the extent of redefining job roles, support structures and reward systems must be redefined in tandem. Hence to ensure the successful implementation of processes that have been redesigned, a methodology which includes best practices to be used must be applied in the design (Mansar & Reijers, 2007).

Therefore, a BPR framework created by Reijers & Mansar (2007) links six elements that are considered critical factors of consideration in redesigning a process and is presented in Figure 4 below. These elements, which are further elaborated on below, include the customers of a business, the products or services created by the business process view from an operational and behavioural perspective, the participants in the business process, which includes the organisational structure and people with a focus on the business culture and matching staff competencies, the information required, the technology used and the external environment. Correspondingly, Gross et al. (2020) used this framework as a grounding theory to explore process redesign alternatives where “to-be” processes have more guidance in implementation and alternatives rather than an overhaul of a process.

Figure 4:

BRP Implementation framework



Source: Mansar & Reijers (2007)

2.4.4 Elements of BPR

2.4.4.1 Customer

The heart of business processes is fulfilling customer expectations and providing customer satisfaction in a manner that is cost-effective and efficient (Borgianni et al., 2015). Frank et al. (2020) indicated that typically BPR is used to create a customer-centric business in which customer needs drive the design of business processes.

2.4.4.2 Product

The products or services generated by the business process are based on the need of the customer and the type of offering decided by the customer to service that need (Mansar & Reijers, 2007; Reijers & Mansar, 2005). Direction (2021) argues that the value of exploration and exploitation can aid companies in enhancing the product development activities with a closer collaboration occurring internally and externally.

2.4.4.3 Business process

Business process under BPR has the main feature of increasing efficiencies while reducing costs (Reijers & Mansar, 2005). Frank et al. (2020) noted that for customer centricity to occur, redesigning business processes is at the centre of it, with the tasks to ultimately create value. In a study conducted on engineering projects, the business process of providing services included a change in strategy, policies, and structure, to provide services in a manner that improved services and provided a competitive advantage (Sunil Kumar & Harshitha, 2019) which in this case was to increase efficiencies and derive competitor advantage as a value creator.

2.4.4.4 Organisational structure

The organisational structure under BPR is made up of users understanding their roles internally and externally, and agents used to conduct specific tasks (Reijers & Mansar, 2005). Moşteanu (2020) reaffirms that new technology has prompted the redesign of organisational structures to face business challenges holistically, which included job requirements and the culture required to balance operations with specialisations.

2.4.4.5 Technology

Mansar & Reijers (2007) refer to technology in BPR as task automation for increasing the execution of tasks at a faster rate and lower cost. In a service industry, the use of technology has created competitive service environments, however, the alignment of the use of technology and human-centred services is to be given careful consideration in use and objective when using BPR (Banica & Patricio, 2020).

2.4.4.6 Information

The way in which businesses create information, as well as the way in which information is used, is a key element of BPR (Mansar & Reijers, 2005). Therefore, the completeness and correctness of information as a key process which is counterintuitive of efficiencies due to it being seen as an added control is a redesign of information from systems because overall, it adds to the credibility of information and less time to perform rework (Mansar & Reijers, 2007). Therefore, information as

part of BPR should be identified as credible sources for users' availability of use (Vizzon et al., 2020).

2.5 Critical success factors and barriers for BPR

The importance of standards and frameworks means that process redesign is carried out robustly where inconsistencies, confusion, and misrepresentation are limited, however, should a flawed map be created to guide a process, the process will inevitably be flawed (Ali Darwish, 2011). Therefore, in facing the main challenge of implementing BPR, the identification and inclusion of success factors and barriers when seeking generic business process redesign success are imperative (Reijers & Mansar, 2005). Additionally, Ravesteyn & Batenburg (2010) identified critical success factors in BPR implementation to be involved stakeholders, communication, and governance, meaning that BPR is not only driven as an IT project. The sections below indicate critical success factors and barriers identified through literature that proves key in this research study.

2.5.1 Critical success factors

As early as 1988, the notion of critical success factors was as important as it is today for business, with the definition being "those things that must be done if a company is to be successful" (Freund, 1988, p.20), which includes analysis of the corporate strategy and vision, determination of success factors to align to the strategy, leveraging of existing strengths and creation of measurement tools to determine operational viability.

Over time, Moeuf et al. (2020) argues that with the introduction of Industry 4.0, critical success factors have been expanded to include conducting a feasibility study when embarking on a new project, ensuring access to company data is available and the right tools are available to analyse, store and report on results, while on the softer side which is equally important, key factors include the importance of communication, manager networks and sourcing the right skills, even if subject matter experts are to be used. Interestingly, Ghobakhloo et al. (2021) identified value drivers of Industry 4.0 to not only be corporate profitability aimed, but socio-environmental sustainability, therefore, success factors are to include a focus on higher economic performance through prioritising long-term sustainability practices as well. The

journey, therefore, for critical success factors due to the influence of technology has evolved from 1988 to 2021 to be an expanded view of its importance when redesigning business practices.

In addition, World Economic Forum (2021) indicated that critical success factors in intelligent automation are to firstly be people centred in change management processes, which is to ensure the people doing the job and the people receiving the end product and service are at the centre of change, the second factor is to ensure management support is available, the third being combining different technologies to perform complex tasks, the fourth including using low coding technologies where people do not require coding and programming skills, and finally the fifth critical success factor is the use of new technologies that is specific to the objectives required in a change programme.

2.5.2 Barriers to BPR

In the absence of critical success factors, barriers in redesigning processes are key to identify because a success of a project is not in avoiding problems but in knowing how to respond to problems when they occur (Torp et al., 2004). Therefore, barriers identified in BPR are segmented based on the following areas below, as defined by Moşteanu (2020).

2.5.2.1 Environmental maturity

Ghobakhloo et al. (2021) found that a common pitfall in BPR is companies failing to be outward looking into the operational environment when redesigning processes as the core focus is on operational weaknesses that need to be addressed, whereas customers, suppliers and other stakeholder weaknesses also need to be identified as a holistic change approach. Fehrer et al. (2022) describes this as redesign “happening in a black box” (p.1), meaning the context of change is not considered, and a lack of instructions to guide users through the redesign steps are common failures experienced.

In a South African context, Aghimien et al. (2022) describes a critical barrier as the lack of availability of digital technology due to the complex nature of needed technologies and associated skills. Furthermore, intellectual property complexities

and the readiness of data required in a business are heightened barriers that add an additional layer to adoption in a South African environment (Akinradewo et al., 2022).

2.5.2.2 Financial challenges

Barmuta et al. (2020) indicated that one of the barriers that prevent businesses from transforming with IAT is the lack of financial funding and required resources due to limited budgets available. Stornelli et al. (2021) argues that economic barriers, which include the high cost of capital with the required need to justify investment creates challenges from the onset when innovation through technology is required. In a South African context, the economic barriers such as a high unemployment rate, poverty, inequality, and fiscal fragility exacerbates the barriers faced (Fotso et al., 2022) when IAT is considered for implementation, and this used in the redesign of business processes.

2.5.2.3 People and culture

Vizzon et al. (2020) included cultural barriers such as resistance to change, excessive or lack of buy-in of transformed process and lack of top management assertion, while tool incompatibility, misunderstandings with stakeholders and a lack of a collaborative environment as pitfalls experienced in BPR implementation. Specifically in South Africa, Kim et al. (2017) resistance to change is a noted barrier as the high unemployment rate gives rise to concerns on further job losses due to the influence technology may have on employment opportunities. This is intensified by the hierarchical structure of businesses where top management support is focused on priority items and should IAT implementation is not seen as important for service and support functions, the barrier to implementation is increased (Akinradewo et al., 2022).

2.5.2.4 Process and tools

Fehrer et al. (2022) indicated that a common failure when processes are redesigned is the lack of consideration to existing business processes that aim to achieve the same goal, which results in duplication of effort. Akinradewo et al. (2022) further indicated that in developing markets, such as South Africa, the security of using such

tools becomes as increased focus due to the susceptibility of information attacks, calling into question the importance of technology governance.

2.6 Chapter summary

Internal audit practices are unique because it is classified as one function that conducts assurance and consulting activities in risk management and governance processes, with the requirement to remain independent in an organisation. The literature review explains the evolution of internal audit practices and how it has changed due to the influence of IAT. The literature review also explains and supports the need to have a guide when redesigning processes, as the lack thereof can have detrimental effects on the redesigned process's long-term effectiveness. Hence, from a theoretical perspective, best practices in the form of success factors and identified barriers in business process redesign have been proven to ensure success in BPR. As such, it is important to understand how the influence of IAT has changed internal audit practices and what success factors and barriers have been experienced in redesigning internal audit practices in South Africa. Chapter three outlines the research questions that guide this study.

3 CHAPTER 3: RESEARCH QUESTIONS

3.1 Chapter introduction

Chapter two highlighted the literature review as well as the theory that underpins this study. Based on the research problem, research purpose and literature review, the research study aimed to understand how intelligent automation technology influenced the redesign of internal audit practices in South Africa and the critical success factors and barriers that were experienced during the implementation of the change with the purpose of being able to leverage change implementation and redesign practices for knowledge workers in the service industry. Therefore, this chapter will explain the research questions in greater detail that was used as the basis for data gathering to inform the discussion and results of the research study.

3.2 Explanation of the research questions

To accomplish the aim of the research study, a main research question which is supported by sub-research questions were developed.

Main question: How has the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa?

The aim of this research question was to understand from a South African context, what critical internal audit practices have been redesigned due to the influence of IAT and during the redesign process, what success factors and barriers have been experienced, which will benefit change implement programmes for knowledge workers in a service industry.

Sub-question 1: Which critical internal audit practices were redesigned to save on time and cost but increase quality and flexibility?

The purpose of this research question was to understand through the lens of business process redesign which internal audit practices have been redesigned due to the constructs of change relating specifically to the six pillars of BPR which is customers, product, business process, organisational structure, technology, and information, which was experienced through the phenomenon of the influence of IAT.

Sub-question 2: What factors were considered successful in redesigning internal audit practices?

The aim of this research question was to understand what BPR patterns or good practices have been applied to the changes experienced in the redesign of internal audit practices that has yielded successful results. The purpose of understanding success factors in redesigning internal audit practices in South Africa is to create a framework for implementation where knowledge workers in service industries can leverage to ensure success in the implementation of change management programmes.

Sub-question 3: What factors were considered barriers to redesigning internal audit practices?

The aim of this research question was to understand what barriers have been experienced in the redesign of internal audit practices that has caused unfavourable results and should be avoided when implementing change management programmes. The purpose of this research question is to understand what problems have been experienced in redesign of internal audit practices in a South African context, so that change management programmes where knowledge workers in a service industry is undertaken, barriers can be identified earlier, and plans put in place to respond quicker to such challenges.

3.3 Chapter summary

This study sought to answer one main research question, which was underpinned by three sub-research questions as set out in this chapter, which were identified to address the gaps in the extant literature presented in Chapter two. This study will aid knowledge workers in the service industry to leverage change implementation and redesign practices. Chapter four will present the research methodology utilised in this research study.

4 CHAPTER 4: RESEARCH METHODOLOGY

4.1 Chapter introduction

Chapter four provides an overview of the research methodology followed to inform the study. As the objective of the study was to explore and uncover the phenomena of redesigned internal audit practices due to the influence of intelligent automation, the research approach was interpretivist. The study followed an inductive, qualitative, exploratory research methodology, with data being collected through in-depth semi-structured interviews, as detailed in this chapter.

4.2 Choice of research design

4.2.1 Purpose of the research design

Lee et al. (1979) and Saunders and Lewis (2018) noted that an explorative research design is well suited to qualitative research methods where the researcher is unsure of the research outcomes, and semi-structured interviews are to be undertaken. The research objective was to understand what critical internal audit practices were redesigned due to IAT and the success factors and barriers experienced. Therefore, to achieve the aim of the study, an explorative research design with the use of semi-structured interviews was appropriate.

4.2.2 Philosophy

The study's objective was to understand what critical internal audit practices were redesigned due to IAT, which is to lead to positive contributions to the internal audit profession to support the changing world of business. The philosophy adopted was an interpretivist philosophy described by Saunders & Lewis (2018) as a philosophy to understand the social world of research subjects from their perspective. The researcher sought to discover how intelligent automation technology influenced the redesign of internal audit practices in South Africa and what critical success factors and barriers were experienced during the implementation of the change through the lens of CAE and Internal Audit Specialists. Therefore, the interpretivist research philosophy was appropriate.

4.2.3 Approach

A 'bottom-up' process, whereby the data is analysed to identify emerging themes, which follow a tentative hypothesis used towards theory development, constitutes an inductive approach (Myers, 2020). Saunders and Lewis (2018) summarise this approach to analyse collected data to build on the theory, which was the case for this research study. As the academic literature is based on the impact of IAT on the change in internal audit processes being under-researched (Christ et al., 2021; Roussy & Perron, 2018), an inductive approach was followed.

4.2.4 Methodological choices

A mono-method study was undertaken as only one set of qualitative data gathered was considered (Merriam & Tisdell, 2015; Saunders and Lewis, 2018). This single data collection technique was used to collect data from research participants, namely in-house internal audit practitioners (CAEs) and external, internal audit specialists from professional service firms (Internal Audit Specialists) in internal audit process redesign. The data collection process with research participants was through in-depth semi-structured interviews held with CAEs and Internal Audit Specialists.

4.2.5 Strategy

Creswell J (2007) describe a phenomenology research strategy to understand people being studied through understanding real-life experiences. Using the participant's accounts and experiences, the phenomenology strategy aims to gather commonalities between research participants through their lived experiences by explaining what they have experienced and how have they experienced it (Creswell et al., 2007). Creswell J (2007) further highlights that a phenomenology study is undertaken when a researcher develops practices or policies through the interviewee's shared experiences.

Hence, in understanding how internal audit practices in South Africa have been redesigned due to the influence of IAT, the researcher sought to understand what CAEs and Internal Audit Specialists experienced through their lived experience in internal audit and the redesigning of internal audit practices with experienced success factors and barriers through the phenomena of redesigned internal audit practices due to the influence of intelligent automation.

This strategy was achieved through semi-structured, qualitative interviews where in-depth questions were designed to gather as much information as possible from CAEs and Internal Audit Specialists who have experienced similar phenomena of change occurring in the internal audit practices of which they have been part. To achieve this, the researcher encouraged research participants to draw on their lived experience in the internal audit professions and reflect on the changes, specifically when intelligent automation was introduced.

4.2.6 Time horizon

A cross-sectional time horizon study was assumed, mainly due to research time constraints. The reason for this selection, as Saunders & Lewis (2018) describes cross-sectional studies to be, is as a snapshot of a topic at a single point in time. This was the case with in-depth, semi-structured interviews being held over a three-week period with research participants to understand at a point in time what their lived experience was in redesigning internal audit practices due to the influence of intelligent automation.

4.3 Research methodology

As the research design was an exploratory, mono method qualitative study, the research methodology focused on the Chief Audit Executives (CAEs) and Internal Audit Specialists in the professional services view, with data being collected through in-depth semi-structured interviews. The research methodology is detailed below.

4.3.1 Population

Saunders & Lewis (2018) describe a population as a “complete set of group members” (p.138), in which case, based on this research topic, the population consisted of all Internal Audit Functions (IAF) in South Africa, inclusive of private and public sectors. All internal audit functions must have an internal audit practice and methodology applied in carrying out audits as regulated by the Institute of Internal Auditors, practice advisory 2000 (Garitte & Vienna, 2018). Therefore, the population was inclusive of the complete set of IAFs and their associated practices that were carried out in the delivery of internal audit services.

As a Chief Audit Executive and Partner govern an internal audit function at a professional services firm, the key examples of a representative of the function under this definition include “in-house” internal audit functions that are mandated by the board of directors to provide audit services for the company and independent consultants from “professional audit service firms” that are outsourced or co-sourced to either perform audit services or supplement an in-house audit function.

4.3.2 Unit of analysis

A unit of analysis is described as an entity or individual that the researcher is focusing the study on (Merriam & Tisdell, 2015); therefore, each internal audit function that has a defined practice or methodology in carrying out internal audit reviews is the unit of analysis, which the CAE and Internal Audit Specialist represented. The unit of analysis that participated in the research study provided insights that enhance the relationship between constructs of redesigned internal audit practices due to IAT and success factors used as well as barriers experienced in the redesign process.

4.3.3 Sampling method and size

A purposive non-probability sampling method, also known as judgemental sampling, was followed. Purposive sampling is used when the researcher’s judgement is relied upon to choose the sample based on the criteria set (Saunders & Lewis, 2018). To ensure information relevant to the research topic is extracted, Merriam and Tisdell (2015) and Saunders and Lewis (2018) noted the importance of selection criteria to ensure an appropriate sample is selected.

Participants that represent the unit of analysis for the research study were chosen based on the following criteria:

- a) Participants ought to have had the experience of 10 years and more in the Internal Audit profession;
- b) Participants are currently working within an IAF or consulting with an IAF;
- c) Participants were to have worked in more than one IAF to be able to offer different perspectives as to what internal audit processes have been redesigned and what type of best practices/ success factors have been used to design the process due to the influence of technological innovation; and
- d) Interaction with the broader business environment through either having an

Executive-level role or a Senior Manager role reporting to the Group structure, where knowledge of the broader Group strategies is known.

Non- probability sampling was used as a complete list of the population is unknown (Saunders & Lewis, 2018). Therefore, since the list of CAEs and Internal Audit Specialists representing the IAFs are unknown, the possible chance of selecting each member in the population is also unknown (Saunders & Lewis, 2018), therefore, non-probability sampling techniques were applied.

A heterogenous purposive sampling strategy was undertaken as heterogeneous samples provide adequate diverse characteristics adding to the variation of data collected (Saunders & Lewis, 2018). Although the researcher sought to interview CAEs and Specialist Internal Auditors, the industry in which participants operate is not limited to selection, allowing for variation in the data collected. Reliance was placed on the professional network the researcher has access to contact potential participants, and through the selection criteria set above, participants were screened before inclusion in the sample.

In considering the sample size, the researcher aimed to conduct 20 interviews, resulting in a sample of 20 CAEs and Specialist Internal Auditors being selected in totality. However, as a phenomenological strategy was selected, it means that experiences gathered are unique from research participants, therefore, the researcher does not expect data saturation but overlapping of significant statements (Creswell J, 2007). As data saturation is reached when the researcher does not observe any new data or themes (Guest et al., 2006), significant statements follow the same approach. By the 16th interview, no new phenomenology was created as the researcher kept track of the new statements created, which means that the 16th interview data saturation was reached.

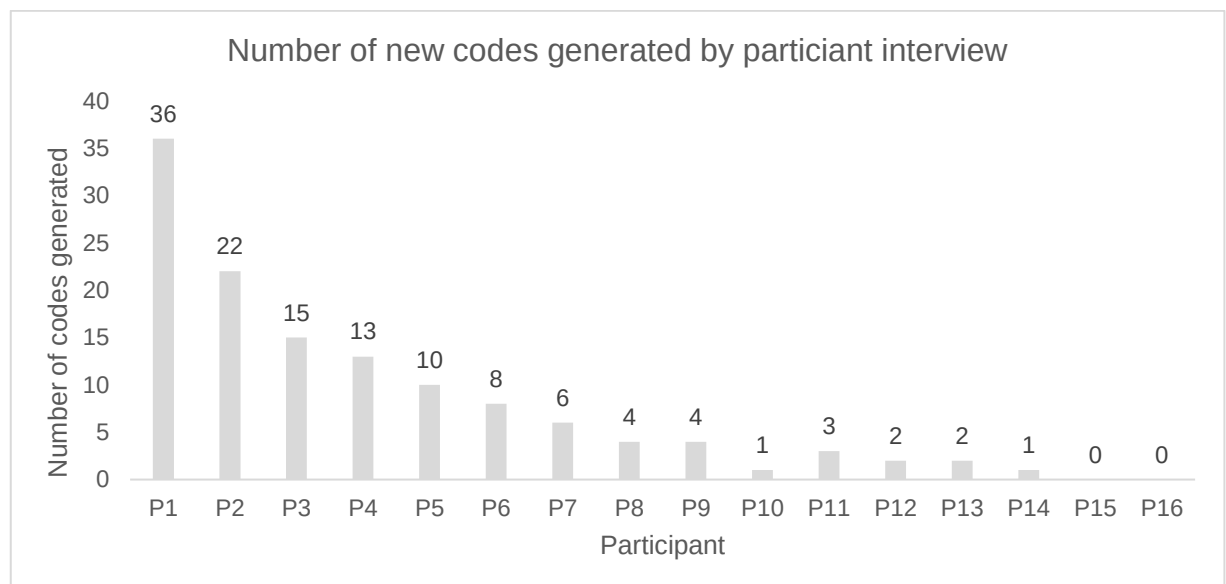
Guest et al. (2006) indicated that typically saturation is reached by the 12th interview, however, when a heterogeneous sample selection method is applied, caution should be provided for a larger sample size. Therefore, the researcher adjusted the sample size to 16 research participants, whereby a sample of eight CAEs from in-house internal audit functions and eight Internal Audit Specialists from professional services firms were interviewed. Additionally, Creswell J (2007) advises that a mid-point of

five to twenty-five individuals would be sufficient to gather lived experiences in determining commonalities.

To demonstrate data saturation being reached where no new significant statements and commonalities are found, Figure 5 below reflects the number of unique codes generated per interview. A total of 127 codes were generated from the data analysis, with the codebook developed from the transcribed interviews using Atlas.ti being included in Annexure 5.

Figure 5

Number of new statements identified by interview



4.3.4 Measurement Instrument

When the interviewer seeks to determine themes from participants using prepared questions that are not in chronological order, and when they accommodate new questions as appropriate, the data collection method followed is through semi-structured interviews (Saunders & Lewis, 2018). As the research study was inductive to seek themes in the phenomenology of the change in internal audit practices due to IAT, semi-structured interviews were held with research participants with open-ended questions to draw themes using synchronous web conferencing services, namely Microsoft Team, as the data collection tool.

The interview questions that applied to answering each sub-research question are mapped in Table 2, together with discussion points and probes used to guide the

question with the interview participant. The sub-questions were used to answer the main research question, which was to understand how the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa through understanding what critical internal audit practices were redesigned due to IAT, as well as understanding critical success factors and barriers experienced.

Table 2

Research Questions and Interview Mapping

Research question	Interview question	Probes / Discussion topics for the question
RQ 1.1: Which critical internal audit practices were redesigned to save time and cost but increase quality and flexibility?	Question 1: Before the introduction of intelligent automation technology, what was the internal audit process in place?	Before the introduction of intelligent automation technology, underpinned by RPA, AI, and ML, what was the experienced internal audit process like? How was the testing of controls performed, what was the internal audit methodology and how was the audit methodology applied, specific to the defined internal audit methodology per the following areas: • Environmental Risk assessment • Internal Audit Planning • Fieldwork • Reporting • Remediations
	Question 2: What key features in the internal audit process have been redesigned due to the introduction of intelligent automation technology?	With specific consideration to IAT, which is RPA, AI, and ML, which internal audit processes were redesigned across the six elements of BPR as follows: • Customer • Product • Business Process • Organisational structure • Technology • Information

Research question	Interview question	Probes / Discussion topics for the question
RQ1.2: What factors were considered successful in redesigning internal audit practices?	Question 3: In your experience, what successful factors were followed in redesigning internal audit processes?	What were success factors identified that could be marked as a must-have when redesigning internal audit practices?
RQ1.3: What factors were considered barriers to redesigning internal audit practices?	Question 4: In your experience, what barriers were faced in redesigning internal audit processes?	What barriers were identified that could be marked as flags when redesigning internal audit practices?

Merriam and Tisdell (2015) indicated that an interview guide that outlines the context and objective of the study should be created. Therefore, an interview guide was created for participants, as reflected in Appendix 1, which outlined the context and objective of the study and provided sufficient background to the research study. The interview guide was discussed with interview participants only once the informed consent letter was explained.

The requirements per the informed consent letter was explained to the research participants, which outlined the confidential nature of the interview and the fact that the interview was based on the participant's voluntary service, which included being able to discontinue the interview at any time. The research participant was drawn to the researcher's details and supervisor's details for further questions as necessary and then asked to confirm the letter, where evidence of acknowledgement was captured through the recording and transcript via the web conferencing service MS Teams. The informed consent letter was also shared with the interview participant via the email invitation to the interview session for record purposes.

A sample of the informed consent statement that research participants acknowledged is available in Annexure 2, along with a sample of the informed consent statement shared via email in Annexure 3.

Moustakas (1994) indicated that when undertaking a phenomenology approach, two general questions need to be answered, which is what has the interviewee experienced per the phenomenon, and how has the context influenced such phenomenon. Therefore, the interview guide consisted of preliminary questions, which were general questions focused on ensuring the criteria for the selected sample were confirmed, and the context that influenced the change phenomenon through the introduction of IAT was understood.

Following the preliminary questions, descriptive questions to understand what the interviewee experienced per the phenomenon, which was the foundation of the research study, were asked by allowing participants to explain their life experiences in the internal audit profession and experiences of what has changed in the internal audit practice due to the introduction of technology. Open-ended questions were designed and asked to answer the research questions designed in Chapter three of the research report. As the interviews were semi-structured, the researcher was flexible in adjusting the order of the interview questions and was performed according to the interaction between the researcher and the participant due to the responses received during the interview. Further probes and responses for clarity were also performed based on the interview information received.

4.3.5 Data gathering process

Specific data collected for the research is considered primary data (Merriam & Tisdell, 2015; Saunders & Lewis, 2018). Therefore, primary data was collected through in-depth semi-structured interviews with participants in the English language, the global business language (Kankaanranta & Louhiala-Salminen, 2013). The discussions allowed the interviewer to probe emerging themes and additional insights by varying the order of questions to accommodate other questions or omitted questions (Saunders & Lewis, 2018) as the interview progressed. This also allowed the interviewer to clarify the understanding of the responses received from participants, as described by Saunders and Lewis (2018).

Two pilot interviews were performed to test the planned interviews and the virtual web interface. Pilot interviews are described as “important for semi-structured interviews” (Saunders & Lewis, 2018, p. 165) and be tested on a minor group of

people who are similar to the research participants. Therefore, before collecting data through interviews, two pilot interviews were held with participants who were similar to the samples selected in that they were practising Internal Audit professionals with more than ten years of experience, although not in a Senior Management role. The reason for having pilot interviews was to test the interview questions and desired outcomes, interview technique and devised script, and test the timing of the interview session and the operational ability of the virtual platform and transcription software used for the interview. Through this exercise, the refinement of two interview questions was made more apparent, and a synopsis of the research questions was provided as an introduction to the research objective.

On a procedural level of interviewing, as the researcher was new to the interview process, a procedural interview guide was suggested to be used by Jacob and Furgerson (2012) and, as such, was created by the researcher, which consists of a script that prompted the researcher on what to say before and after the interview and to take participants through the informed consent statement and directed the interviewer in terms of the information to be collected.

The semi-structured interviews were conducted virtually, on a one-on-one basis, via the Microsoft Teams virtual platform. This was done based on interview preference as all interviewees either worked remotely or in a hybrid situation where limited time to meet in person was noted. The researcher and participant tested the platform through video feedback before the interview was conducted, and to ensure accurate transcription, the transcript and recording functionality was initiated first. Noted through this process, two interviews had to be rescheduled due to poor network connections and thus were performed at a later stage. Furthermore, a quiet place with no distractions was requested of all participants, and with video feedback as well as audio, confirmation of recording and transcription was noted and through recording, acknowledgement of the informed consent letter was performed.

Jacob and Furgerson (2012) indicated that at the closing of an interview, the researcher should inquire if participants will make themselves available for further questions or to provide further clarification if required, which was performed at the end of each interview. The researcher also made notes, key points, and important insights from each interview to refer to during the data analysis and coding phase.

4.3.6 Analysis approach

Merriam and Tisdell (2015) indicated that research findings are derived through data analysis procedures from qualitative data obtained. Primary data obtained through semi-structured interviews were captured in audio and text format. All interviews held were digitally transcribed using the software application Microsoft Teams. The researcher evaluated all transcripts derived from Microsoft Teams by listening to the recording and editing the transcript to ensure the accuracy of words, acronyms and grammar that punctuates meaning in the transcript. This exercise was conducted over two weeks and took approximately 32 hours, which aided the researcher in understanding key concepts that might have been missed in the interview itself.

Using Atlas.ti, a qualitative data analysis software, each interview transcribed as text data from Microsoft Teams was digitally input into Atlas.ti and analysed to derive key themes (Saunders & Lewis, 2018). Moustakas (1994) highlighted that the interview approach should begin with the researcher sharing their personal experience about the phenomenon of the study, and then the focus should shift to the interviewee's experience of the study, whereby each response from the interviewee is equal value and be documented in a list without overlap, as this process is called horizontalisation. In the data analysis phase, four key steps and the description of the process, indicated in Table 3 were carried out (Moustakas, 1994):

Table 3

Data Analysis Steps

Steps	Process
Step 1: Personal experience	A full description of the researcher's experience of the phenomenon was provided. This step aimed to highlight and document the researcher's personal experience to set the scene where the focus was shifted to the research participant to determine the phenomenon experienced.
Step 2: Horizontalization	Each statement from the research participant was seen to hold equal value. Therefore, significant statements are highlighted from each interview that is nonoverlapping and nonrepetitive.
Step 3: Clustering	Based on the significant statements obtained in step 2 through the transcriptions, the researcher created clusters of meaning called themes using Atlas.ti where no names of individuals or organisations are reported. A textual description of the themes was used to detail the research

Steps	Process
	participants' experience, which includes how the setting influenced the interviewee's experience of the phenomenon thematically and without an identifier to the research participant, i.e., through aggregated reporting.
Step 4: Essential invariant structure	The phenomenon's essence was summarised through the lived experiences obtained through horizontalisation and clustering. This step aimed to produce common experiences shared by the research participants.

4.3.7 Data trustworthiness and rigour

The credibility of research findings is underpinned by the quality of data collected during the research (Roulston, 2010). Therefore, to achieve data quality in the research study, the researcher implemented the following ways as suggested by Roulston (2010):

- Two pilot interviews were conducted with internal audit professionals before the primary interviews were held with research participants. This allowed the researcher to test the clarity of the questions and the level of information derived through the questions. Pilot interview participants were not part of the sample of research participants and thus maintained the independence of responses received, contributing to the reliability of research results.
- Two triangulation methods are applied, firstly, interviews were held with two types of focus groups, namely, CAEs and Internal Audit Specialists. The triangulation of responses from CAEs was sense checked with responses from Internal Audit Specialists and vice versa for the validity of research results which was referred to as respondent triangulation. The second method applied is theoretical triangulation, which uses theories to explain and interpret the outcomes of the semi-structured interviews held. Saunders and Lewis (2018) explain that triangulation is used to enhance the quality and credibility of qualitative research studies.
- Research participants sampled were selected from different industries to ensure variation in the data, which positively influenced the reliability of research results.
- The research questions were designed to start in a general nature and lead to specific questions, which limited researcher bias.

- The researcher also took on a neutral role in the interview process by contributing minimally to the talk once a question was asked, as (Foddy, 1993) indicated that minimal dialogue will yield a greater depth of interviews.
- Research participants were assured through the informed consent statement of the confidentiality of the interview. This allowed for reliable data to be shared by the research participant.
- To ensure the anonymity of research participants, data is stored in a secure and encrypted folder without identifiers of the research participant or company they work for.

4.3.8 Research ethics

Before undertaking the data collection phase, the researcher applied for ethical clearance from the University of Pretoria's Gordon Institute of Business Science Research Ethics Committee. The application was accompanied by a signed application form, the research methodology, the interview guide, and the informed consent letter applicable to this study.

Ethics clearance aimed to ensure that the researcher adhered to the ethical principles required and, through this process, shared the informed consent letter with each interview participant ahead of the interview and confirmed the letter on call at the start of the interview. Participants were reminded that the interview was voluntary and could be terminated at any time by themselves. Confidentiality of the information shared during the interview was reiterated, with outcomes being thematised anonymously. Refer to Annexure 4 for the ethical clearance approval form received from the University of Pretoria's Ethics Committee.

4.3.9 Limitations

As the research study undertaken was an exploratory, qualitative research study, generalisability of the results exists (Queirós, Faria, & Almeida, 2017). Additionally, due to the design and scope of the research study, the following limitations were predicted:

- Researcher bias: research participants selected, and assumptions applied when selecting research participants (Queirós et al., 2017). The researcher, in this instance, is an Internal Audit professional, therefore the bias of change

that has transpired in the profession and best practices used from the researcher's perspective needed to be set aside during the interview, allowing the participant to share their lived experience without any confirmation or denial of the information shared. Due to this possibility, post-interview checks were held with research participants to ensure the interpretation of their responses was correct.

- Subject bias: research participants may not share truthful or reliable information in interviews (Saunders & Lewis, 2018) anticipated. Therefore, the informed consent statement was reiterated at the start of the interview with mention of how responses were going to be captured anonymously; and
- Time horizon: as the study undertaken was based on interviews held at a point in time, inferences based on changes in the internal audit practice post the discussions cannot be done in future periods (Merriam & Tisdell, 2015; Saunders & Lewis, 2018).

The researcher implemented the quality control procedures documented in section 4.3.7 above to mitigate the limitations noted.

4.3.10 Data analysis and storage

Upon request for interviews with stakeholders, the Informed Consent Letter was circulated to highlight the confidentiality of the interview and the fact that the interview is voluntary, which is in writing and signed by both the researcher and supervisor with contact details. The researcher ensured the participant was aware that they may resign from the interview at any point and could decline to answer interview questions. The researcher also makes it known upon introduction that the information gathered is for study purposes which will then be collated with other interviews held, and that no personal details or organisation names will be reported on, ensuring confidentiality.

Data collected is securely stored without identifiers such as names or organisation of employment of research participants and will be held on the GIBS Data Storage system, which will be saved for ten years per the University requirements. Therefore, the researcher will save signed informed consent statements, transcriptions, recordings, and interviews electronically on the GIBS Data Storage system.

4.4 Chapter summary

This chapter presented the research methodology which was used to inform this research study. the study followed an inductive, qualitative, exploratory research methodology, with data being collected through in-depth semi-structured interviews. The results of the semi-structured interviews held based on the research methodology applied are indicated in Chapter five.

5 CHAPTER 5: RESULTS

5.1 Chapter introduction

Chapter five presents an overview of the results obtained through the qualitative research study, which comprised of 16 semi-structured interviews with research participants as the objective of the study was to explore and uncover the phenomena of redesigned internal audit practices due to the influence of intelligent automation, the results are contrary to the supporting literature and the assumptions that drove the current study. It is important to note that the findings uncovered were, in some instances, contradictory to the literature on changed audit practices, whereby some aspects of perceived change in audit practices have been experienced, however, limited in a South African context. Therefore, the findings were first categorised based on significant statements from which code groups and themes emerged, even if the themes were not previously considered in the literature review.

In accordance with the data analysis structure for a phenomenological research study, this chapter begins by describing the researcher's own experience of the phenomenon, which is followed by a description of the sample selected and horizontalisation of significant statements identified per research participant and then followed by the presentation of results per sub-research question identified in Chapter three that aims to answer the overall research question through the sampled participants lived experience of the phenomenon.

5.2 Researcher's personal experience

The researcher is an internal auditor by profession with 12 years of experience and has experienced the introduction of technology in the audit practices she has been a part of. Having come from a background at one of the big four accounting and auditing firms in South Africa, the researcher has experience across a range of industries, including financial services, mining, higher education, and training and FMCG. The researcher also has international experience in audit practices through her secondment to the United Kingdom and Europe, which as developed countries, expectations of changed practices was heightened.

The researcher has since been part of an in-house audit practice in the insurance industry, where the focus on changes due to the introduction of technology has

become critical. Additionally, on a macro level, the focus and attention on transformation and change in internal audit practices have been noted in the profession as a priority area.

Through the researcher's lived experience, the changes experienced due to the introduction of technology included full population testing where applicable, for instances where data was available and complete. However, the methodology of testing did not change. Manual excel spreadsheets were created, and the medium of maintaining the spreadsheets changed from a manual file to an electronic file. However, the expectations of stakeholders and businesses increased significantly. This created a divide regarding expectations of results through technology and the disability to deliver such expectations where internal audit services are provided.

Additionally, the changes associated with such an introduction were experienced in a haphazard manner whereby a strategy of implementation was not defined, nor was the process to be followed or the measurement criteria required to determine the success of such implementation. This resulted in changes being initiated but not fully implemented. Furthermore, the researcher has a core background in internal audit practices governed by a framework from the Institute of Internal Auditors, whereby technological skillsets are not offered as part of the formal training and accreditation process. However, with the introduction of technology, the need for IT skills has increased, which means a mismatch exists where traditional skills differ from required skills.

The researcher feels it essential to include an example of her experience with the phenomenon and the study's constructs of changed audit practices. In a recent acquisition of an audit software system at her current employer, the expectation of reducing costs, providing better coverage and real-time reporting, as well as efficiencies of performing internal audit reviews, was clearly defined, especially since the company this has been implemented in is data rich.

However, two years post-acquisition and use of such software system, slow progress has been made on the expected changes. A notable incident occurred when the senior executive team enquired about the real-time reporting of key risks that had a regulatory impact, which an answer could only be provided weeks later.

The investment of the software system was not commensurate with the value currently being extracted, therefore, the rising concerns for the profession and the relevance in assurance provided due to the constant change in businesses risk and opportunities were in question.

This, together with the realisation that the audit practices in South Africa are understudied, led the researcher to explore the phenomenon of change through the business process redesign of internal audit practices in South Africa, specifically based on the introduction of intelligent automation technology.

With this explanation, the researcher attempts to append her own experiences and judgements of the perceived change in internal audit practices, as increased awareness of the researcher's bias provides a more objective account of the phenomenon in order to better understand the lived experiences of more senior audit practitioners who are charged with the responsibility of implementing such change in their organisations and clients organisations that are serviced through assurance and governance processes.

5.3 Horizontalization of data

5.3.1 Description of the sample

As part of the data collection process, interviews were held with 16 research participants in total. However, to perform data triangulation, the sample was split between eight in-house internal audit practitioners and eight internal audit practitioners from professional service firms. The sample selected was based on senior-level roles, which included the titles of Senior Manager, Director, Partner, and Chief Audit Executive (CAE), with 15 years of experience and more. Therefore, the credibility of interviewees was deemed appropriate and could part-take in the research study.

The sampling approach was intended to be across a range of South African industries, including financial services, insurance, mining, agriculture, and fast-moving consumer goods (FMCG), to achieve heterogeneity in the sample and provide richness in results from the data collected. However, the sample confirmed, based on availability, which was ultimately interviewed, was predominantly in the

financial services and insurance industry that met the criteria. To maintain confidentiality, a code was generated for each significant statement identified which was then used to categorise and thematise the results obtained.

Data was collected over three weeks through semi-structured interviews being held virtually over MS Teams based on the availability of participants. As the interviews were not held in person, the request for participants to be in an uninterrupted area was performed, with permission to record the interview and commence electronic transcription through the MS Teams functionality. To ensure the building of trust, video cameras were switched on, and participants were taken through the informed consent letter and the anonymity of results collation and reporting.

On average, the interviews lasted about 45 minutes, with the longest interview being 55 minutes and the shortest taking place in 22 minutes. The interview statistics are presented in Table 4 below.

Table 4

Interview Statistics

Description	Statistic
Data collection period	Three weeks and two days
Total participants interviewed	16
The total length of interviews held	12 hours, 2 minutes, and 38 seconds
Average interview length	45 minutes and 2 seconds
Shortest interview length	22 minutes and 54 seconds
Longest interview length	58 minutes and 55 seconds

5.3.2 Triangulation of data

The researcher undertook to explore the views of the redesign of internal audit practices based on the phenomena of redesigned internal audit practices due to the influence of intelligent automation from an in-house CAE practitioner lens and from an Internal Audit Specialist lens who is part of a professional services firm where multiple in-house audit functions were consulted. The triangulation of responses from the two distinct groups was to assure the validity of findings and determine if the themes emerging were based on a collective experience regardless of being an in-house function or a consulting firm.

The themes that emerged per research question and the frequency of responses based on each group are depicted in Table 5 below. This has highlighted the expected change based on literature, which differs from the lived experience of research participants, which ultimately differed from the main research question that the researcher set out to answer.

Table 5

Triangulation Matrix

Research question	Construct	No. of in-house respondents (out of a total of 8)	No. professional services respondents (out of a total of 8)	Total respondents (out of a total of 16)
Sub-Research Question 1: Which critical internal audit practices were redesigned to save on time and cost but increase quality and flexibility?	Customer	4	5	9
	Products	6	5	11
	Business process	8	8	16
	Organisational structure	5	4	9
	Technology	7	8	15
	Information	8	8	16
Sub-Research Question 2: What factors were considered successful in redesigning internal audit practices?	Business context	4	6	10
	Buy-in	5	5	10
	Stakeholder alignment	4	7	11
	Cross skills	6	6	12
	Soft skills	8	8	16
	Culture	7	4	11
Sub-Research Question 3: What factors were considered barriers to redesigning internal audit practices?	Environmental maturity	7	4	11
	Unrealistic budget	5	3	8
	People and culture	7	7	14
	Process and tools	6	8	14

5.3.3 Significant statements

Significant statements are highlighted through the use of Atlas.ti, from each interview that is nonoverlapping and nonrepetitive based on each of the sub-research questions highlighted in Chapter three, designed to answer the main research question. Initially, 257 codes were generated, which were further narrowed and merged into 146 codes. A summary of the sample and the background of each sample, whereby the significant statements made by the participant, which reflected the phenomenon experienced, is reflected in Table 6 below. Once the codes were established, categorisation based on meaning and themes was merged for the discussion below.

Table 6

Summary of Research Participants and Significant Statements Gathered

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
PS-P1	Professional Service	Grew up in Durban and moved to Johannesburg based on opportunities presented in the audit. Started in IT audit at an in-house function and moved to one of the big four audit firms where the participant was promoted to the senior role of Director. Has 15 years of experience.	<i>"Over time, I believe that with risk management and the understanding of the three layers of defence, the appreciation for internal audit shifted away from just being the police officers to somewhat of guardians of the brand of an organisation" 1:6 12 in 1. Transcript- Professional Firm 1</i>
PS-P2	Professional Service	Grew up in Lenasia and initially did a degree in Accounting Science. However, did not enjoy financial auditing and moved into internal auditing with a passion for data science. They started their career in one of the big four audit firms	<i>"Technology helps us get what needs to be done faster. It takes hours out of a job, so we can really focus on the strategic stuff. It gives us the ability to differentiate what we do. You can produce an audit in a matter of minutes, you can produce a set of results in a matter of minutes, and you can produce dashboards in a matter of minutes,</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
		and have not moved since. Participant has 19 years of experience and is in a senior Director position.	<i>but I think the fundamentals of how you audit will never change. The tools and the capability to help you audit, of course, has changed." 2:54 62 in 2. Transcript- Professional Firm 2</i>
IH-P3	In-House	Grew up in Cape Town and is a Chartered Accountant. Started articles at a mid-tier firm and moved into a number of in-house audit functions, where they currently lead the audit function. Has 16 years of experience.	<i>"In terms of data analytics, we've really upped our game with that. We do a lot more data analytics. We've been using Excel, but we're looking at other instruments to keep us going because business is going towards more digital space. We have to definitely match them every step of the way. We can't be left behind on businesses journey. So we have to be there right alongside them and talking about digital and systems" 3:55 48 – 49 in 3. Transcript- In house 1</i>
PS-P4	Professional Service	A very senior audit professional that Chairs a number of audit committees and has extensive knowledge in audit due to their background as a Chartered Accountant. Has experience in many industries with over 30 years of knowledge gained in the audit practice.	<i>"85% of internal auditors have migrated [with technology] but there are firms that look at the review mirror where the portfolio of evidence is paper based and is not using technology. While the others are using technology, you have to be self-sufficient.... there is still a way to go, tech has made the composition of IA very different. There will be many engineers and "geeks" that need to look at the depth. There is a shift in how to convey messages in a simple way and where different approaches are needed, also what is needed and the communication style and the</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
			<i>importance of this." 4:28 43 in 4. Transcript- Professional Firm 3</i>
IH-P5	In-House	An in-house professional that is in an Executive Committee position. Has experience in an audit firm, however predominant experience derived from inhouse practices over 16 years.	<i>"But and this is the big but for me when I speak like what my organisation and technology, it was largely like many others in South Africa, with a fragmented culture where departments went out and procured systems, and as the business became more integrated, people look for more efficiencies, and the ecosystem became more connected. Then, people realise that, hey, our systems don't talk to each other. The kind of data we're using is incorrect, and we're not taking into account the changes in the field and people realise that it's not as easy to change to this modern world. If I look at where IA was and the processes for me the core processes of internal audit or methodology have not changed." 5:70 11 – 12 in 5. Transcript- In house 2</i>
IH-P6	In-House	A senior manager that has 17 years of experience in internal audit. Started articles at a mid-tier firm and is of the personal philosophy of moving companies every 4 years to derive benefits from changed practices.	<i>"We as audit can make sure that we are ready, BUT our rate of change towards digitisation also speaks to the rate of change of that particular organisation and that organisation has not adopted things. You can try your best to digitise, and I always say this you will put a Toyota Corolla engine inside a Porsche, but it's just not moving at the same rate and as a community of people everything used to be manual, but</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
			<i>what has happened is we've confused automation for things being scanned and being put in a digital format." 6:46 3 – 4 in 6. Transcript- In house 3</i>
PS-P7	Professional Service	Director at a professional services firm, where international exposure through secondments has been experienced over the 15 years of experience gained. Has been part of two different professional services firms.	<i>" I think the business or clients or stakeholders are looking for a bit more now, they're looking for a lot more in terms of how's our IT infrastructure, how are our systems from a cyber security and our cyber posture and if it's more specialized areas, they're looking for more insights either actuarial, so you find that from a typical sort of audit firm that provides either external audit or internal audit services they've really had to look for more skills to complement those teams than the traditional having just accountants or internal auditor. Then when you audit, you want to give your stakeholders or your clients a more rounded picture of their control environment." 7:47 12 – 13 in 7. Transcript- Professional Firm 4</i>
PS-P8	Professional Service	Partner at a professional services firm with senior leadership experience across a range of clients serviced in internal audit. Has not been part of any other professional services firm since articles and hence has 20 years of experience.	<i>" I do still believe that as internal auditors holistically, there's still quite a way to go in terms of change management. I feel that we still have that little team of that's the data team and they must run the analytics, somebody else must follow up and then the rest of the auditors must then do the manual testing. And I think that sort of silo mentality has to change at a very,</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
			<i>very rapid pace."</i> 8:18 15 in 8. Transcript- Professional Firm 5
IH-P9	In-House	18 years of derived experience in in-house practices. Executive level position where articles were initially completed at a mid-tier firm. Experience includes being part of business operations and hence deep understanding stakeholder expectations of the internal audit profession.	<i>"Tech is fundamentally shifting the value proposition of internal audit and you have to start thinking what are the game changes for the business and if those are game changers for the business, how are we getting in early as internal audit."</i> 9:48 48 in 9. Transcript- In house 4
PS-P10	Professional Service	Partner at a big four audit firm, where the portfolio of clients includes internal and external audit clients. Chartered Accountant by profession, however over 30 years of experience in internal audit practices as well.	<i>"And with the tech we now go to in our language, we call it a data first approach. So, we go back to core data or raw data and we have tools that we use to analyse the data and see what are the trends, what are the outputs and if I need to sample, how I'm going to use this risk criteria that's embedded in the tools to inform my specific testing. So rather apply a risk criterion in selecting samples once again, with the objective to provide assurance, but also with the objective to provide management with that value add and also insight into the data."</i> 10:33 17 in 10. Transcript- Professional Firm 6
IH-P11	In-House	Senior manager in an in-house audit practice with a background in operational management	<i>"I still say show us the case studies of internal audit functions that has actually evolved with the times, that is implementing these technologies</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
		and governance processes. Has 16 years of experience and started articles at a big four audit firm.	<i>to date, I haven't gotten a name to say that this is the gold standard. This is the five out of five internal audit function in the world so to be honest, I think we have not as a profession actually done the homework around what does it actually mean and what would make automation, robotics processing engineering efficient in the sense of the audit world." 11:3 4 in 11. Transcript- In house 5</i>
IH-P12	In-House	Senior manager at a large organisation that has many audit staff, with a strong focus on digitalisation of the practice. Has 18 years of experience across a number of practices.	<i>"So, I think there's a lot of drive and it almost sounds like a bit of a cliché when you say it, but you sort of get to a point where you do more with less budget type of scenario. It's a very hard thing to achieve, but I think at the end of the day that is probably the way things are going to start going. You have to think how you can make your audit team a lot more efficient. And, in the same way try and provide more assurance and try and push for those types of initiatives. And I think the only way you can really get to that point is to get smarter with the types of technologies that you ultimately use." 12:40 27 – 28 in 12. Transcript- In house 6</i>
PS-P13	Professional Service	Africa led role in internal audit with a task of internal practice development in one of the big four audit firms. Has over 22 years of	<i>"You can imagine that actually now to understand the process you have to follow the data, otherwise you can't do a proper assessment of the end-to-end process. If you're business auditor and you can't audit</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
		experience with deep knowledge in benchmark analysis of client's current audit practices.	<i>a process end to end, then you are becoming, I guess irrelevant in a way."</i> 13:10 23 in 13. Transcript- Professional Firm 7
PS-P14	Professional Service	Professional services partner for a mid-tier audit firm. Started in external audit and currently leads the internal audit division with 23 years of experience.	<i>"There are audit firms that have gone out to market saying we've got RPA and we can do this and this and this and this, making this promise, and they use all these fancy cliché terms in the marketing bits and pieces, and obviously you don't necessarily have an understanding for the technicalities behind it, but you know a little bit about assurance when you sit there and you listen to this, you think, oh, no you made this promise, so now you better be able to deliver it."</i> 14:25 27 in 14. Transcript- Professional Firm 8
IH-P15	In-House	In house senior manager with a background in IT and cyber security audit. Holds over 16 years of experience across two audit functions.	<i>"But when you get it right, when you get it right to be agile, in other words, attentive to the risks that are happening in the business, to be able to be dynamic and shift your focus around, give assurance at the right times and then with the right skill set again like I said, to bold those insights, that's when I think you build good credibility as an audit function. If you fail to do those things though, obviously the converse happens."</i> 15:34 98 in 15. Transcript- In house 7
IH-P16	In-House	With 17 years of experience in IT, the participant is currently in a	<i>"Functions fail and because they don't know what it is that they want to achieve. So, if the audit function</i>

Participant Code	Professional Service / In-house role	Background and experience	Key quotes
		lead role to digitalise audit practices in their current organisation. Noted that the audit team is the largest interviews representative of 230 team members.	<i>doesn't have a strategy, if they don't have clear objectives, no digital transformation initiative will work. No amount of tech or any skills, or really smart people, you can even get people from Google to come and work for you. It's not going to make any difference."</i> 16:4 14 in 16. <i>Transcript- In house 8</i>

5.4 Presentation of results

To answer the main research question, sub-research questions were designed. Therefore, the results below are clustered into 1st order and 2nd order themes which are displayed per sub-research question, which was detailed in Chapter three, and which lead to answering the main research question.

It is important to note that although findings from the interviews held with research participants were predominantly from the financial services sector, which is known to be data-rich, elements of business process redesign have not been experienced to its full extent for some research participants, whilst others who have experienced change due to the introduction of IAT have claimed that it is in its infancy stages. Therefore, the themes noted below are based on the current lived experience of research participants and based on their perception of what will change or influence change further.

Main Research Question: How has the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa?

5.5 Results for Sub-Research Question 1:

Which critical internal audit practices were redesigned to save on time and cost but increase quality and flexibility?

The purpose of this research question was to understand through the lens of business process redesign which internal audit practices have been redesigned due to the constructs of change relating specifically to the six pillars of design, which are customers, product, business process, organisational structure, technology and information, that was experienced through the phenomenon of the influence of intelligent automation technology.

To obtain the objective, the research questions were asked in two parts from participants, which included, firstly, to understand through their lived experience what the profession and practices were like prior to the introduction of IAT and secondly, following the introduction of IAT, what has been redesigned based on the constructs

of business process redesign. The findings of the research question are highlighted in the section that follows, which includes a display of results based on traditional practices and then changed audit practices through common themes where direct quotations are included as exemplars and are not intended to be exhaustive.

5.5.1 Customer

Change in stakeholder expectations

In the audit world, a customer is referred to as a recipient of audit services and is typically a business unit owner and lead as well as the Board of Directors and Audit Committee. Hence, the reference below for stakeholders is the customer.

Traditionally, many research participants, notably PS-P2, IH-P3, PS-P4, IH-P6 and IH-P9, described the customer as a stakeholder who had limited expectations of internal audit as an assurance practice.

"There was really no need to do anything different and there wasn't a demand to do something fancy from stakeholders." (PS-P2)

For the customer, it was a compliance exercise that was used as evidence for shareholders that adequate governance structures are in place and reviewed annually without any real knowledge of the internal audit practice.

"We were that tick-box [compliance] function that would just sit at that third line of defence and come in and say, OK, let me look at your books" (PS-P1)

"Management didn't really know what you would do, just you do the testing. That's it. You get it done and that's the expectation and that's what your clients are paying for." (IH-P3)

Value adding partner

From being an independent function, a value adding partner is considered an auditor who works with business continuously to derive maximum benefit for the organisation rather than audit for a period of time and exist.

Over time, customers experience of the profession changed due to the world of technology to be more of a valued partner to business which was reflected through responses from PS-P4, IH-P5, PS-P8 and PS-P14.

"They see you as someone that needs to be able to value add and not just audit that's being done at somebody or to someone, but rather with them. So, they want to take all auditors on this journey, almost as a partnership"
(IH-P5)

However, a research participant indicated that internal audit has not transformed yet to meet the change in stakeholder expectation, it is, however where the profession is heading towards and from the preconceived idea of 'just' audit and assurance over controls, internal audit will evolve to include consulting elements which are driven through collaboration with customers.

"And for me, that's where I see us eventually going that it's not about fighting this audit report and findings and tracking findings but becoming much more fluid in what it is that we're doing and how we are collaborating with business at the end of the day. We can almost say that as part of it we have this consulting leg that comes in and is more advisory and more real time." (PS-P4)

This has resulted in having more meaningful conversations with customers, which means the role of internal audit becomes uplifted, and the profession is seen as a trusted and valued business partner.

" You know, the engagement piece becomes so much more elevated you become trusted because they're like, oh, internal audits going to know about this, or they might even approach you before you go to them. So, your profile just becomes elevated as a trusted, value business partner." (IH-P5)

Additionally, due to the corporate failures experienced by companies, more focus is on the work internal audit has performed by Boards of Directors and Audit Committees, indicating that renewed focus on the value internal audit has to customers.

"You do have extremities, but I do see that there is this renewed understanding by certain individuals [stakeholders], particularly those that have been involved in high profile boards, because I think they've kind of seen what happens if you don't have proper authentic corporate governance." (PS-P14)

However, interestingly, a research participant pointed out that although there is a perceived idea of customer expectations of internal audit changing to be more of a valued partner, the reality is that a conflicting expression exists between the audit committee and management level staff.

"A lot of execs would lie through their teeth and tell you that it has changed but there is still an expectation of a traditional auditor that must go in and check that someone has done their job and I can tell you know it's what do they, the audit committee, wants and what management executives expect, are two different things half of the time." (IH-P6)

5.5.2 Product

The product referred to for internal audit services includes the service offerings that audit provides and hence the outcomes from the audit reviews performed that can be in the shape of an audit report, results included in audit committee and board packs, exception reporting and management letters.

Change in reports

Traditionally, internal audit products were based on lengthy reports (PS-P4, IH- P5 and PS- P8) being provided that were word heavy and filled with detail that as indicated by research participants were sad and boring (PS-P2).

"Audit reports looked very bland and very sad, it was always the same colour scheme, the same rating scheme, they were loaded [Microsoft] Word reports. It was always this massive summary and in many ways a carbon copy of your scope letter and you know, I can only criticise it, but the realities were that it was quite boring" (PS-P2)

The change in the product being delivered included an easy-to-read format that can be proactive to the questions and insights needed by stakeholders.

"I would rather come and talk to you for half an hour as opposed to then writing an engagement letter documenting your system, doing testing, writing findings is I could have told you that up front and I could have given you a two-page report to do that. I didn't have to write the 40-page audit report with notices and a distribution list and and and..." (IH-P9)

Contrary to this view of change of products, a research participant indicated that although some change is noted, there is a need for enhancement of audit reports that need to transform to include attestation as well as assurance.

"So, I think what needs to change is exactly this around the traditional audit report that will potentially fall away to say that it will become attestation of the control environment based on the monitoring of the KRIs or the key risk indicators in that space." (IH-P11)

Real time assurance

Real time assurance is the provision of audit services in a short time, with exceptions and errors being noted when the audit is performed rather than when the audit concludes.

Insights can now be shared through a live dashboard that operates on a real time basis, where questions can be answered through a display of data, without needing to further confirm the accuracy of results through queries with the team. This can be referred to as real time assurance.

"When she [Chief Audit Executive] goes to the audit committee, I want her to take the risk dashboard because when asked a question sometimes she needs to send a WhatsApp. Now she sits with all the data. She can actually show it and drill down when she's in consultation with the with the audit committee." (IH-P16)

Furthermore, the way in which controls have been reported included long lead times from when an issue is noted to when it is reported which is now on a real time basis as part of the reporting process.

"Also moving more into this robotics type of era and all of that sort of also drives that more real time information, giving information that is more instead of giving that view like the traditional audit " (PS-P7)

And, from worded reports, some participants experienced a change in now compiling dashboards that are easy to read and includes graphs.

"So, we're moving away from word reports, because the devils in the detail, if you want the detail and get a document for the detail but they want dashboards. They want to see graphs." (PS- P2)

Another participant indicated that they are still embarking on a journey of updating their reports due to seeing the need arise from stakeholders.

"We are embarking on a whole findings kind of tracker with how to analyse our findings, how to put things in graphical point of view, because I think that's important for presenting to audit committees and to management by being a little bit more visual rather than stats." (IH-P3)

While another confirmed that business experience audit to be slow and not as modern as expected which is in contravention of the aspect of efficiency to be gained in business process redesign.

"Business does experience us to be slow and they experience us to be fidgeting with paper a lot. So that's creating an impression that we're not as modern ourselves than what we expect the business to be" (PS-P13).

Notably, an emergent product that most internal audit practices have begun implementing, includes the concept of continuous monitoring. Research participants PS-P2, PS-P7, IH-P9, IH-P11, IH-P12, PS-P13 and OH-P15, indicated that where data is readily available, scripts have been deployed to continuously monitor the

execution of automated controls and once a flag is noted, real time evaluation and intervention can be performed by auditors which is a real time offering of new products.

"You got a piece of continuous monitoring happening now, where these areas are being monitored continuously...but a lot of it is now up to the real time continuous auditing and then monitoring of those exceptions and reporting on those exceptions and ensuring that those exceptions are remediated." (PS-P7).

5.5.3 Business Process

The business process referred to as part of this element of the BPR framework relates to the audit methodology and approach, which are key operational steps in conducting an internal audit.

Risk sensing

Risk sensing is defined as the evaluation of an environment to determine high priority risks that may deter a business from obtaining the objectives set. Therefore, risk sensing is the first step in an audit process.

The key themes identified include that traditionally, risk sensing of an environment was deemed reactive based on what was happening in the business environment.

"But why I stay basic and deliberate about it is because I believe it was quite reactive internal audit risk identification and risk assessment was quite reactive to businesses and really driven by the regulations of the country." (PS-11)

This included a number of risks being evaluated on an annual basis with limited deviations from the plan should new risks be identified with is still being noted. This was largely attributed to training of auditors being in the field of finance with limited training on risk management practices and own frameworks in place.

"Let's go back 20 years ago when we executed Internal audit as far as the risks where the organisation was concerned. There are some areas audited annually and a limited number of ad-hoc requests, which I still see now." (PS-P4)

"...there was limited training on risk management principles because they tend to think that whatever we need to look at must only be financial risks...so people need to understand and be taught and be familiarized with their own risk management frameworks and what it actually entails." (IH-P6)

Coverage

Coverage includes the scope and timing of an area that is to be audited and the level of assurance provided over the controls in place.

Coverage provided through audits were based on targeted problem areas, that were surface level and did not provide insights that were of value to the customer.

"At the very early stages we were asking the question is there a problem and then we were checking only that." (IH-P1)

Whereas the change in business process now includes greater depth through greater coverage which ensures that the scope of audits being performed are wider and focuses on multiple areas than what was traditionally experienced.

"So, I think planning, fieldwork and reporting in terms of the coverage, has increased and the depth that we go into is definitely a lot more, then we did before." (IH-P3)

"I think the first thing is the scope of internal audit is substantially wider. So, where my plan would have been X number of hours, the plan now is typically a multiple of that because it's not just refocusing on certain things...but this big risk universe that needs to be covered off through some sort of assurance." (PS-P14)

Some participants indicated that cost is a factor in the audit process, whereby through increased coverage, the population testing gets bigger but when performed by technology, it drives down the cost per sample item tested and increases efficiency.

"Audit coverage for me is obviously key, I think also to a certain extent, cost as well, if you think about it, if you are able to provide more coverage, you also save cost to a certain extent as well, because you're able to pick up more by total population testing and you pick up big errors" (IH-P12)

"You [internal audit] want to do more work with less, you want to look at the cost of audit within your organization.... So how am I going to achieve this? What do I need to do to achieve these objectives in a cost effective and efficient manner." (IH-P16)

Methodology

An audit methodology is inclusive of the planning of an audit which encapsulates the scope of an audit area, fieldwork, which is the execution of an audit, reporting which is the presentation of results and remediations which is the verification of newly implemented controls that have been identified through the results of an audit.

Some research participants (IH-P5, PS-P8, IH-P9 and IH-P15) indicated that internal audits business processes have matured but to a certain extent. The methodology on how to perform an audit, has not changed, even though the way interaction and assurance with business has changed.

"So that was for us the second step from a paper based to now we've got a system, but the process remains the same, so it's still a process.... So, the methodology, if you think about it logically, that has just stayed the same, it's just being the medium on which you do it." (IH-P9)

Contrary to the above statement, only one participant indicated a noticeable shift in the audit methodology where a digital audit methodology has been implemented, to ensure audits are aligned to regulations.

"I mean, international standards of auditing still guide you, interesting we have GAM, we call it the global audit methodology, but now recently it changed to digital GAM and digital and global audit methodology where we now train the regulator on this digital audit methodology." (PS-P10)

Overall, the theme that emerged under the business process element of business process redesign from in-house internal audit functions, IH-P6, IH-P8, IH-P9, IH-P11 and IH15 was that the end vision of the use of technology was to increase efficiency and decrease costs as part of the method of internal audit practices being applied, however currently it is a work in progress with a gold standard still being developed as the profession still matures with business.

"That was the end vision [technology implementation], it didn't work out that way and that's because everyone's methodology is different, and I think that's also it's an indication to say that we have matured but we still require more refinement" (IH-P9)

"We have to as an internal audit community [define] what does it look like. I'm meaning, data-driven audits, scripting, continuous monitoring, and those type of things, but I think we haven't actually, I haven't seen one case study in the industry where a form of robotics or AI is being used to perform the role of an auditor" (IH- P11)

Audit approach

An audit approach is the method in which an audit is performed. This includes the way risks and controls are evaluated for design and implementation adequacy and effectiveness.

Interestingly, professional service firms, PS-P1, PS-P5, PS-P7 and PS-P10, indicated that the audit approach has changed drastically with the introduction of technology because apart from the real time auditing, data is being used to target problem areas before an audit commences, however during an audit, it appears to still be in infancy stages.

"But what has changed with the technology is one, I think the audit approach has changed drastically, so what you get now is the data teams or the IT teams kick off the audits sort of before your traditional auditor gets into that space" (PS-P7)

"To be very honest, I'm yet to see a company get it right. I don't know a client nationally and to some extent, even internationally where they've got auditing [data] working as intended." (PS-P2)

5.5.4 Organisational structure

Hierarchy

The way in which audits are reviewed and signed off internally, prior to communication of results to stakeholders, follows a chain of command which is based on the hierarchy of the audit team.

The organisational structure of an audit function is considered as a hierarchical structure by some participants, notably, IH-P16, IH-P3 and PS-P8, with many layers of decision making which can translate into role conflict where an auditor is expected to be able to do more with less, however within the confines of an authoritative structure.

"You know, this whole hierarchy of thinking where you know it's the partner and this one and that one and this one review this, and people think in that way as well, which for me is a big risk for digital transformation within internal audit context because to be innovative and to be an audit function of the future, you just can't have this archival thinking" (IH-P16)

Skillsets

Typical audit skillsets are technical skills in terms of risk and control identification and evaluation and soft skills in terms of how the evaluation is presented and communicated to stakeholders.

The shift anticipated with the introduction of technology, based on some research participants such as IH-P9, IH-P11 and PS-P14, is the need for a holistic auditor who

can add value through a holistic lens of assurance, which includes various skill sets. Therefore, the way that the structure currently is, will change. It is important to note that participants did not indicate that it has changed, therefore using language indicated a future state.

"Alternatively, somebody who's got an engineering degree to some extent will be part of audit. So, we do see that there's this demand for very specialized skills because it's not just about doing the normal routine audits anymore. It's about actually dealing with the real risks that the guys are picking up on the on the register without the hierarchy of decision making currently in place." (PS-P14)

A significant shift has been in the skillset required based on the introduction of technology, which includes a variety of skills that are audit related. And due to this change, the need to upskill auditors on basic IT skills is imperative, however not currently in place.

"I think a big piece of the skill set we are seeing is that the demand for the internal auditor is not your traditional BCom internal audit or Institute of internal audit auditor profile, we need somebody that would be able to do business analysis, IT analysis, BI and almost be an SME into the risk and control functions." (IH-P11)

Culture:

A research participant indicated that a crucial element to an organisation structure is a supportive culture to embrace changes and allow for adoption and adaption.

"The culture of that team or that organization is critical, because if your culture and your organization does not support this radical change and the people are not comfortable with that then it's hard" (IH-P16)

5.5.5 Technology

Technology as an enabler

Majority of research participants, (PS-P1, PS-P2, PS-P7, PS-P8, IH-P16, IH-P9 and IH-P15), indicated that technology is an enabler to perform evolved functions for the internal audit function.

"I come back to a comment that I've mentioned before, and it is tech and innovation. I think those are two vital enablers to be a successful internal auditor of the future, we need to understand these complex environments that are coming and be able to use it, but at the end of the day, it is just tech used to enable more from auditors" (PS-P8)

IH-P9 stressed that internal auditors who went from paper-based files to using a software system to store work perform, should not confuse that with digitalisation and technological innovation because it is a medium used to maintain files, as was the medium of a file cover when printouts were used.

"So as the world was evolving, internal audit functions are maturing and we moved from these paper files into audit software, but the confusion shouldn't be that we innovated with tech, we just moved mediums of storage." (IH-P9)

However, with the introduction of technology in the business environment, the automation of certain controls, means that although internal audit might not have automated the work performed, the assurance that they need to provide to business has evolved to provide assurance over the way business now operates which opens the question about internal audit skillset when using technology.

"The question now is how to provide value to the business now with the business being really automated and a lot of transactions running through systems, the question is does internal audit understand the new processes or the new system driven environment and that's required a different type of skill within internal audit because your traditional auditor wouldn't be able to understand some of the complexity of transactions being run through systems." (PS-P7)

Limited use of technology

At the core, the use of technology to perform robotic analysis, artificial intelligence to conduct real time audits and automated assurance, are currently “buzzwords” being used without guidance and standards on how to perform such functions as part of the internal audit function, which means that the use of technology is limited in conducting internal audit reviews (IH-P6, PS-P8, IH-P11, IH-P12, PS-P14, IH-P15)

"And again, these are buzzwords, so everyone keeps pushing for it. They expect all audit functions to do it, but without that underlying guidance and standards as to how it should actually be done or what is acceptable or not acceptable etcetera." (IH-P15)

"And my experience as well is that whilst it [digitalisation] has been around for a while for me, it's still feels like a buzzword because I'm yet to see a client that has fully, fully, fully entrenched it." (PS-P8)

5.5.6 Information

Change in sampling

Sampling is referred to as the selected number of transactions used to validate controls in place, which is also used to

The information required to conduct internal audit reviews are based on access to data. Most research participants, namely PS-P1, PS-P4, PS-P7, PS-P10, IH-P3, IH-P5 and IH-P12, indicated that the biggest change that they have experienced is due to the introduction of technology has been the change in which greater coverage is now provided due to greater access audit has to data and information. The primary change of access to information is the way in while the core of assurance is provided, which is through sampling.

"Audit was very much sample based where you only been able to focus on a very small sample of a much bigger population and there were quite a few limitations and I know also clients complained because how can you say a very small sample is really representative of what whatever is happening in the population and because you got so and so exceptions you now have a

view of limited reliance and even the final outcome in the rating scale that you use." (PS-P10)

"Suddenly you've got your stakeholders attention more because you're talking about the entire population of transactions, not a sample that again is not a true reflection of the business" (IH-P5)

This has not only increased coverage but provided greater assurance to stakeholders which is where audit makes a greater impact to business.

"The fact that you can cover much bigger populations if you just take that component of it [access to data], that's probably the biggest singular impact in the audit space that's possible. I'm going from a very limited manual sample to potentially everything. You know, if you talk about impact, it's the biggest impact that one can make." (IH-P15)

However, instances where sampling is still necessary to gather data for evaluation based on manual processes is still in place.

"There is still a place for manual sampling within audit. I think you can't eradicate it completely, so there is still a space for sort of a manual sampling approach. A good example is a typical human resources function that keeps employee files in manual files tucked away in the cupboard or in a room somewhere. So, there's still that bit of where you'd still need to pick a sample and actually go and verify things manually." (PS-P7)

Data structures

Additionally, instances where information from a system cannot be obtained is present, such as the way data is structured and how it is extracted.

"So even if you're getting data, you can never do a proper analysis across because every system has restrictions in the way that data is presented and what data can actually be pulled out." (PS-P8)

Additionally, the type of data required could be in various peripheral systems that are equally important for the risks identified.

"The way that business processes now consume a lot more data in its execution, is not only transactional data that's important. There are so many other data points around it, around consumerism. If you think about your own organization, the data that we use from a business intelligence perspective, so just a lot more data, a lot more unstructured data that one needs to think about." (PS-P13)

Data access

A research participant indicated that a limitation for audit functions also resides in the willingness of the organisation to allow access to data which efforts of audit can cease to exist if the willingness is not prevalent.

"And then I guess the other big point to think of as potential stumbling block is also your accessibility to data. How open is your organization for you to access your databases and to get the necessary data that you ultimately require" (IH-P12)

Data quality

And even if data is provided, the aspect of data quality is still in question because assurance of controls relies heavily on the type of data and usability of the data being provided.

"So whilst we do try and do as much analytics as we want to at all means nothing If your data quality is not at the right standard, and that's what we found, so we try and do analytics, you follow up and then you find out you know what the data I'm actually working with cannot be really used to run through proper analytics from an efficiency point of view." (PS-P8)

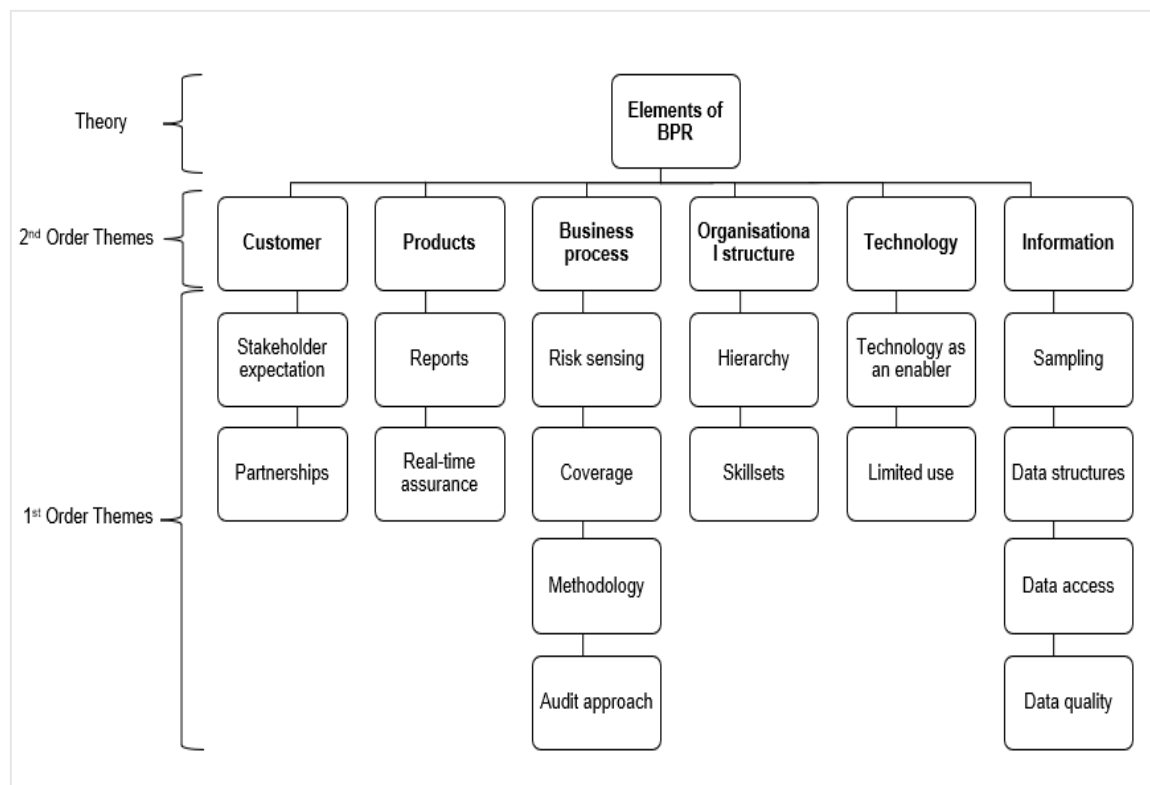
5.5.7 Conclusion of sub-research question 1

The first order themes derived from the results of the semi-structured interviews were then filtered into the second order themes that were matched to the theory of BPR. The interviews held indicated that internal audit has changed to a certain degree and the phenomenon of change due to the introduction of IAT has been experienced across the six elements of BPR, however it is limited, with internal audit practices in South Africa not having fully changed to perform automated testing through intelligent automation testing such as RPA, ML and AI.

A summary of the 1st order themes, and 2nd order themes identified through the BPR framework where the influence of IAT on internal audit is displayed in Figure 6.

Figure 6:

The 1st Order Themes, and 2nd Order Themes Noted Under the BPR Framework



5.6 Results for Sub-Research Question 2:

What factors were considered successful in redesigning internal audit practices?

The aim of this research question was to understand what BPR patterns or good practices have been applied to the changes experienced in the design of internal audit practices that has yielded successful results.

As many research participants have indicated that through their lived experience, change using technology has been limited, successful factors were spoken off in a broad manner, and where some participants have not experienced it as yet, believe that these are the building blocks when change in an internal audit practice has to occur, which includes the themes identified below.

5.6.1 Business environment

Some research participants indicated that one of the key success factors is understanding the business context before embarking on an internal audit change programme. Functions need to know the context of their business environment. They need to perform an analysis of the level of automation in the business itself to determine if it's a good fit.

"You need to understand the automation landscape, it works well for some environments and not for others. So, without understanding whether it's a good fit or not, you cannot embark on this journey." (IH-P15)

Additionally, apart from understanding the level of automation in the business, understanding the people in terms of role players and how they integrate into the business and the wider ecosystem, and understanding what has worked previously in the business will already aid in the design of implementing a change programme.

"Go and understand who the people are, don't just understand how the business works. (PS-P2)

"Again, the companies are ecosystem connected together. If you do not understand all of it, you don't have deep knowledge, you're not going to know how the interlink processes impact the area that you're auditing and will work and won't work come time [technology implementation]" (IH-P5)

5.6.2 Buy in

Another key success factor that was indicated by most research participants included buy-in from stakeholders, clients, management, and the internal audit team on how the use of technology will evolve internal audit practices which will be of benefit to them.

"Everyone, stakeholders, management, even your team needs to know why you need more IT resources or why you need these digital tools in the function, but you almost want them to understand it and to fully grasp the ask and once there is buy in at that level, I think then it's easier to implement the change." (PS-P7)

This includes buy-in at not every level of an organisation but at the right levels which include audit committee, board, and senior management levels.

"You're looking for buy in, you need to make sure you've got the right buy in the right level." (PS-P8)

"It's always important that the audit committee who internal audit reports into needs to understand that [technological changes]. I think once it's understood at that level and its adequate buy in from that level, it's then also making sure that the senior management or executive management just below the board understand that and buy into it as well." (IH-P12)

Buy-in was also noted in the form of co-collaborating with clients to remedy gaps identified through agreed action plans.

"When we close-out we don't have suggestions, we don't have management "should", it's all agreed action plans with management and they will have to

implement every single action item on there for recommendations which signals buying into the value of audit." (IH-P3)

Additionally, a key decision maker in the world of IT is the data custodians, hence buy-in from key IT personal who understand why the data is required and the benefit for them apart from the notion of audit and data critique is a key success factor.

"They're [IT custodians] very picky and choosy of who they let touch their information, and so you can almost imagine that if you don't have their buy in, it becomes very difficult to convince them that this is something needed from the get-go. If you get those people on the same page, if you are able to talk their language, if you're able to explain to them why this stuff matters, it becomes very easy to actually get your stuff out of systems." (PS-P2)

The thematic of stakeholders below were deduced from buy-in where to be able to allow for buy-in, there needs to be stakeholder alignment.

5.6.3 Stakeholder alignment

The benefit of working with stakeholders in designing a transformed internal audit practice, means to align policies and procedures with the business to take them along the journey. This is the ultimate aim of being seen as a true business partner where the change implemented is not in isolation.

"The further transformation sits within your people, your processes your policies...not something that you do in isolation you have to work very closely with all the other stakeholders to make sure that the transformation actually happens and that whatever you're doing with technology then translates into a success. (IH-P16)

Furthermore, research participants indicated that stakeholder roles and responsibilities include cost reduction and driving efficiencies for a business. Therefore, the alignment of internal audit practices becoming more efficient and cost effective, while providing more coverage needs to be shown to stakeholders.

"So, efficiencies and audit coverage for me is obviously key. I think also to a certain extent, cost as well, because if you are able to provide more coverage, you also save cost to a certain extent, which is the same mandate stakeholders hold, reduce cost and increase efficiencies." (IH-P12)

However, the aim of stakeholder alignment is to build trust, especially with the corporate scandals, the trust equation between stakeholders and internal audit is critical.

"I mean with all the public pressure and what's happening, I think our key responsibility will still be trust. It will still be trust and we must deliver on that trust for both members [stakeholders] and also for the public." (PS-P10)

In particular, Professional Services Participant 1 (PS-P1), mentioned the trust equation six times in the interview held. The context of trust with stakeholders through transparency through the use of technology was emphasized to ensure corporate governance and transparency of audit work performed is amplified.

"There was this massive spike in reliance of technology because of the trust equation. It would seem to be more trusted than people and with people, we always wanted to maintain that trust equation and provide transparency of what we do." (PS-P1)

5.6.4 Cross skills

Most research participants stressed the fact that an important success factor for transformed internal audit practices is to have internal auditors who are skilled in both audit and IT knowledge. This includes being able to interrogate data sets and perform data analytics through a blend of audit skills.

"We have been talking about it for a long time about the cross-skilling piece. Because if I go to market, I'm not finding an individual who comes with a blend of both skills, who has sufficient data analytics experience or training from a tertiary perspective and audit skills" (IH-P9)

In-house research participant P11 (IH-P11), indicated that apart from IT skills, having various skills such as finance, actuarial and data is what the future of audit is, should the use of technology be a success for functions.

"And that would be IT, finance, actuarial and data in one brain. They [stakeholders] want the outcome of the audit to tick all of those boxes and it becomes very difficult to execute upon because now you are trying to build individuals that have the whole mindset. " (IH-P11)

The above is amplified by the need to focus on training and development of internal audit practitioners where it is a continuous cycle to enable for a dynamic practice which is forward thinking. Some research participants, namely IH-P5, IH-P6, IH-P15 and PS-P8, also indicated that apart from formal training, keeping abreast of changes in technology and the practice development in the world is key to a successful auditor.

"Then you also need to do the same for your audit career to ensure that you stay up to date with the changes in approach and technology that's emerging in parts of the world and South Africa." (IH-P5)

Additionally, upskilling should not only occur at an internal audit practice level but at an organisational level in terms of what internal audit practices are and how it differs to other assurance providers, especially when more coverage and data is being looked at.

"There's a lot of education that needs to go into upskilling stakeholders because one of the enablers is the awareness of what internal audit has [products] and the value they have." (IH-P6)

5.6.5 Soft skills

Research participants mentioned that increased awareness of soft skills in the audit profession, will be a key success factor in a change management programme. This includes communication and the ability to articulate the advanced work being done through technology either verbally or non-verbally.

"You have to have the ability to communicate as well and if you do not communicate, you can do wonderful work, but it goes to waste. (IH-P5)

Part of communication and soft skills include being able to prime stakeholders and audit staff to embrace change and persuade them to allow the change to occur to ensure that the aim of it is achieved.

"And it's also just to keep on prepping people to say that we are we are on a journey together and I think internal audit functions that embrace change will change into their envisioned process" (PS-P7)

"There's always persuasion and negotiation that are quite high up there ...to enable you to take a seat at any table" (PS-P1)

The power of networking and having networks was mentioned by a few research participants such as IH-P9, who indicated that having strong networking skills means that you will be part of business initiatives playing a proactive role.

"CAEs need to be networking to be able to have that perspective because no one comes to me walks up to my desk and says.... I'm planning on embarking on that initiative," (IH-P9)

5.6.6 Culture

To implement change, the success factors which enable overall redesign is having the right attitude, understanding and team synergy to not only inspire change but to have teams united in executing change programmes. Most research participants indicated that teamwork is the essential foundation for transformation as teams can inspire and challenge each other to do things differently.

" I always say 70% of that transformation is actually just the team's attitude and their culture and how they inspire each other and how they inspire the business. If you have the right attitude, then you're halfway there." (PS-P13).

"In order to succeed in the internal audit space, you have to have a mentality of teamwork – you are part of the team, you need to be professional, responsive and punctual" (PS-P4)

Additionally, some research participants, namely, PS-P2, IH-P5, PS-P8 and IH-P11, indicated that the culture of internal audit needs to shift to a futuristic state where challenging businesses on sustainability practices, such as Environmental, Social and Governance (ESG) as well as internal audits own sustainability will be key.

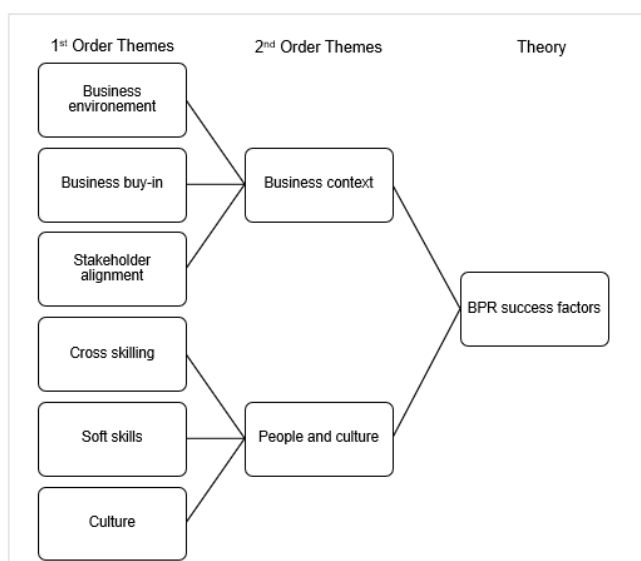
"Maybe its 10 years, maybe sooner.... ESG is going to come in and is going to play a vital role in all that we do and what does that mean from a governance and culture perspective? How do you actually audit and manage these processes around an autonomous process" (PS-P8)

5.6.7 Conclusion of sub-research question 2

As the full depth of BPR has not been experienced by research participants, success factors in the implementation of BPR could not be easily and readily discerned from the data. However, the following 1st order and 2nd order themes, indicated in Figure 7 below, under success factors that might hold true in a BPR implementation programme were identified through the research interviews held.

Figure 7:

1st order and 2nd order Thematic Success Factors



5.7 Results for Sub-Research Question 3

What factors were considered barriers to redesigning internal audit practices?

The significant statements highlighted by research participants indicated that the phenomenon of change due to the influence of IAT has not been experienced in full by internal audit practices in South Africa. Therefore, the research question has been adapted during the interview to understand what the barriers facing internal audit practices in South Africa from redesigning audit practices. The themes identified are presented below.

5.7.1 Environmental maturity

Research participants indicated that the barriers faced when changing audit practices and where the starting point is the biggest hurdle, is when the environment is not technologically mature. This includes business operations not being data ready with limited use of technology in the environment.

"Internal audit is 100% aligned to your maturity of the organization. So, in the institution there isn't a lot of development and all of that happening, so we have to plan and audit on what is there." (IH-P11)

Supplement to that is the companies' policies on how data is managed and stored. Internal audit can obtain tools and technology, however if the company policy is restricted to how this is stored, the red tape to use the data to provide assurance does not enable change to occur.

"Understand what is your company's policies around cloud for example, are they comfortable with you housing things off-site." (IH-P12)

Apart from the organisation, regulators and policy makers that govern the internal audit profession do add a layer of complexity in how assurance is provided through technology. If the way an audit is conducted is not consistent with the level of assurance required, then the traditional way methods of auditing remain.

"But it is important to take a regulator on this journey because if they are saying, listen, we actually mandated everyone to still tick 60 items back to cash then obviously a correlation is not going to be sufficient to address that specific rule. "(PS-P10)

"As you start introducing things like automation, continuous control monitoring, a very data-driven audit approach, it becomes very grey in terms of what the international standards say you supposed to do. And we haven't been able to figure out some of those things." (IH-P15)

Automating in the audit space requires a clear strategy of implementation that needs to be aligned to the business's technological strategy. Furthermore, if the business is mature and data rich, the barriers of still performing operational type reviews and not strategic reviews in line with the technology framework of the business, will make it hard for audit to change.

"Audit teams have also not been great about connecting themselves with the group's Technology Strategy." (PS-P13)

"And so, I think we functions are getting it wrong is that they're not focusing on, the strategic pieces" (IH-P9)

5.7.2 Financial challenges

In any change management programme, the monetary cost associated is a key topic of discussion. However, in an internal audit paradigm, which is synonymous with being support service, the cost of acquisition of technology and tools required to make the shift is always understated. The cost of advanced technologies for the highest levels of assurance also comes at a price so the expectation grows but the budgets shrink.

" Do we have the budget to do it? With technology comes cost and an internal audit department is last because support functions are always the first to be asked to cut costs in an organization. So, the challenge is not that the department or the head of department or the auditors aren't aware of the

technology ready to upscale its whether they are given that platform based on cost" (IH-P5)

"And as internal audit functions start providing more and more value and insight to audit committees, the expectation is growing.... but they [stakeholders] want you to be streamlined from a cost perspective." (IH-P9)

A research participant indicated that apart from unrealistic costs, not doing the adequate due diligence from a cost perspective when implementing technology to change the level of assurance provided, can cause implementation to halt and stay stagnant until there is budget available.

"Make sure you do your homework. I mean make sure you understand what is out there in the market, because the next thing you know you can't carry on because you have run out of budget" (IH-P12)

5.7.3 People and culture

The barrier faced currently is that an array of skillsets is required, however once team members obtain this skill, the demand in the market increases, therefore critical people to the change programme for audit leave.

"Generally, nobody stays long enough to bring it to account. They leave and then what." (IH-P6)

The challenge then becomes, how is a system build that is not reliant on the person but the team and anyone who joins the programme where it is changing, buys into that vision and becomes an active contributor.

"The challenge is how do we build a process that it's not as much dependent on the person, but on you being committed, being open minded, being willing to learn every day, and how do you make them buy into the vision that we have, because we had this vision for probably around six years and we still haven't gotten to it so how do you make everyone in the department actually buy into this" (IH-P11)

From a culture side, the barrier faced includes resistance to change and being rigid in the way that change occurs because of being governed by rules. This includes stifling free-thinking and innovation which means changes occur at a slow rate, which can be attributed to how hierarchical internal audit practices are.

"The people in our business are old. They don't like change, so if you can't go to a client and understand what they doing and what environment they have, you can't actually give them advice of what they need." (PS- P1)

"Being so stuck in the rules is not conducive for freethinking and innovation." (IH-P16)

Another challenge noted by a research participant is the arrogance faced by other assurance providers that limits change in an internal audit environment. This includes stakeholders viewing certain assurance providers as "the alpha," with other functions being a support to the alpha, which causes an arrogance in the way change is then created.

"If I had to look at the eco system of all the assurance providers in a typical combined assurance forum, the external audit function is the alpha in that relationship. They still command the greatest amount of respect and I think to some extent they drive who's going to do what...and I think that there's a level of arrogance that limits change in the internal audit profession" (PS-P13)

5.7.4 Process and tools

A level of duplication exists when transforming internal audit practice. Research participants indicated that a duplication of effort has been experienced because they are unaware of the tools already being used by business to achieve their objective. This includes skillsets that are already in the business which is required for digitalisation.

"What's important is duplication of effort as well. I think you need to make sure you understand already what other tools are being used within the

organization and understand actually what is the company already doing around these things that you don't end up duplicating certain thing" (IH-P12).

A hypothetical example shared by a research participant indicated that for example, if the right skills are acquired but the capability is still lacking in terms of technology, policies and tools, a barrier to implementation will exist.

"Let's say for example you have people but if you don't have processes to pull data, house data, data pool technology and if you don't understand your policies and your security around all of those things, then how are you going to get your process right? If you have no programming capability, how do we get it right." (PS-P2).

This was reinforced by research participant IH-P16, who indicated that a barrier faced is making sure the auditor needs everything to make a success of the change, which includes time and thinking space.

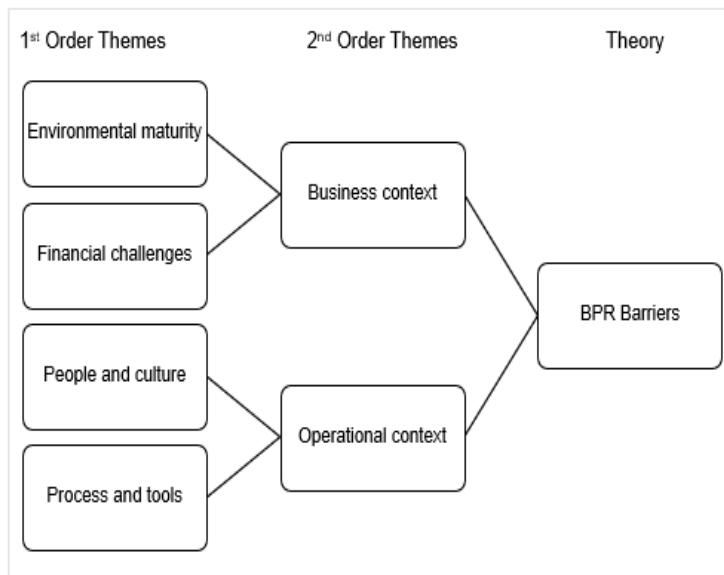
"You want to make sure that every auditor has everything they need to do an amazing job that contributes to the execution of the strategy. Do they have everything that's needed for this transformation to happen? Do they have enough time? Do they have enough think space." (IH-P16)

5.7.5 Conclusion of sub-research question 3

Research participants indicated the reasons that has hindered the full implementation of IAT in the audit practices that they have been a part of based on their lived experience. This included the organisation not being mature enough to enable change to occur using technology, limited budgets available to implement tools and build capabilities, not having the right people and skills, or people being afraid of change, and the process and tools required for the change is limited. Figure 8 below displays the 1st order and 2nd order themes identified.

Figure 8

1st Order and 2nd Order Thematic Barriers



5.8 Overall result of the main research question

Main Research Question: How has the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa?

Through the results displayed in sub-research question 1, 2 and 3, it is evident that the internal audit function in South Africa has not redesigned their internal audit practices due to the introduction of technology. This means that best practices have not had the opportunity of development as many research participants indicated that although some elements of internal audit have changed, the essence, the methodology and in some instances, the level of assurance has not changed.

Therefore, the research question that the researcher sought to answer could not be answered through the framework of business process redesign, however a consistent theme of the need for change has been highlighted, which was evidenced through a shift in stakeholder expectations, where greater coverage is required by assurance providers. The need for change was also highlighted through the greater use of technology by organisations, creating increased availability of data, which signals the type of assurance needing to change.

Although, internal audit practices in South Africa have not been redesigned, elements of change have been noted through the results of the interviews held. This included themes around the transformation of audit practices through skills, capabilities, tools, and technology and a cultural and mindset shift into being a value adding partner to business.

As the merit derived from the results obtained through the semi-structured interviews held, include the relevance of change required of internal audit practices, the researcher will aim to discuss the barriers faced in redesigning internal audit practices in South Africa to determine if a change in the BPR model that is more suitable for a South African context and environment is required. This will include critical success factors that will enable redesign to occur, which invariably will formulate a framework for redesigning internal audit practices in South Africa.

5.9 Summary description and essence

The results obtained from the semi-structured interviews were thematised across three sub-research questions, with the aim to be able to answer the main research question of how intelligent automation technology influenced the redesign of internal audit practices in South Africa and the critical success factors and barriers that were experienced during the implementation of the change. The research sought to understand what critical internal audit practices were redesigned, as well as how research participants experienced success factors and barriers to the occurred change.

The essence of the results was that internal audit practices had experienced limited changes in internal audit practices due to the influence and use of intelligent automation technology. Therefore, internal audit practices have experienced a limited change in a South African context and as such, success factors used in redesigning practices as well as barriers experienced were highlighted as factors to be considered.

The key themes derived included the notion that stakeholder expectations of assurance functions have changed over time. There is an increased need for internal audit and other assurance providers to provide greater coverage of risks and controls

in an organisation due to the increased frauds and business failures that have been publicised. The influence of IAT must be to some extent, provided for greater coverage, which has shifted the perceived idea of internal auditors being focused on compliance to now being value-adding partners. Reporting on areas of weakness and gaps found in business have changed to a limited degree. Internal audit products that are communicated through reports to stakeholders have changed in length and include more graphics, however, a small minority of research participants indicated that they have moved to real time assurance and reporting, while most research participants indicated that it is a need but not a reality.

The core business process of internal audit has not changed. It was noted that increased risk sensing and coverage of risks have changed, however, the audit methodology and approach are the same as before, largely due to regulators and standards set by the governing bodies being met.

A need for change was highlighted by most research participants where the current organisational structure of internal audit practices is hierarchical and requires many approvals before decisions are made, which has translated into stifled innovation. However, an increased need and an active change has occurred in terms of the array of skills that now make up internal audit practices, of which IT and cyber skills being the most notable.

Under technology and information, it was noted that research participants identify with technology as an enabler of change but not change itself. As the results suggest that limited change has occurred, the access to quality data has been slow with the resultant impact on a slow uptake of robotic process analysis and artificial intelligence type programmes.

Research participants shared that through their lived experience, the success factors that would increase the use of technology and transform practices to be more efficient and effective included auditors being able to understand the business context, obtain buy-in for change from all levels in the organisation which includes aligning with stakeholders. Additionally, cross-skilling and upskilling of auditors to be a holistic auditor is critical. Enhanced soft skills through communication, persuasion,

negotiation, and networking are equally as important as cultivating the right attitude towards change.

In trying to understand the reasons why internal audit has been slow to change and redesign audit processes, the researcher inquired as to the barriers faced based on the lived experience of the research participant. The results included that some business environments were not mature enough and did not adopt technology in the same way that would enable internal audit to have the benefit of digitisation. Information is generally inaccessible due to the quality or because it is fragmented. Research participants also noted that due to internal audit being seen as a business support function, budgets for technology transformation are limited, resulting in less resources being available to purchase software systems, train auditors and build custom reports.

Additionally, barriers faced include loss of knowledge when key implementers leave, auditors being resistant to change, and a notion that some assurance providers are more important than others, thus internal audit practices are overlooked, is experienced which hinders change implementation programmes. This is compounded by potential duplication with what the business is performing, however, auditors without adequate capabilities and capacity have been experienced to slow down the transformation process of using technology to provide assurance.

Although the results identified do not align perfectly with business process redesign theory, the value of understanding the constructs through the lens of further literature is necessary.

5.10 Chapter summary

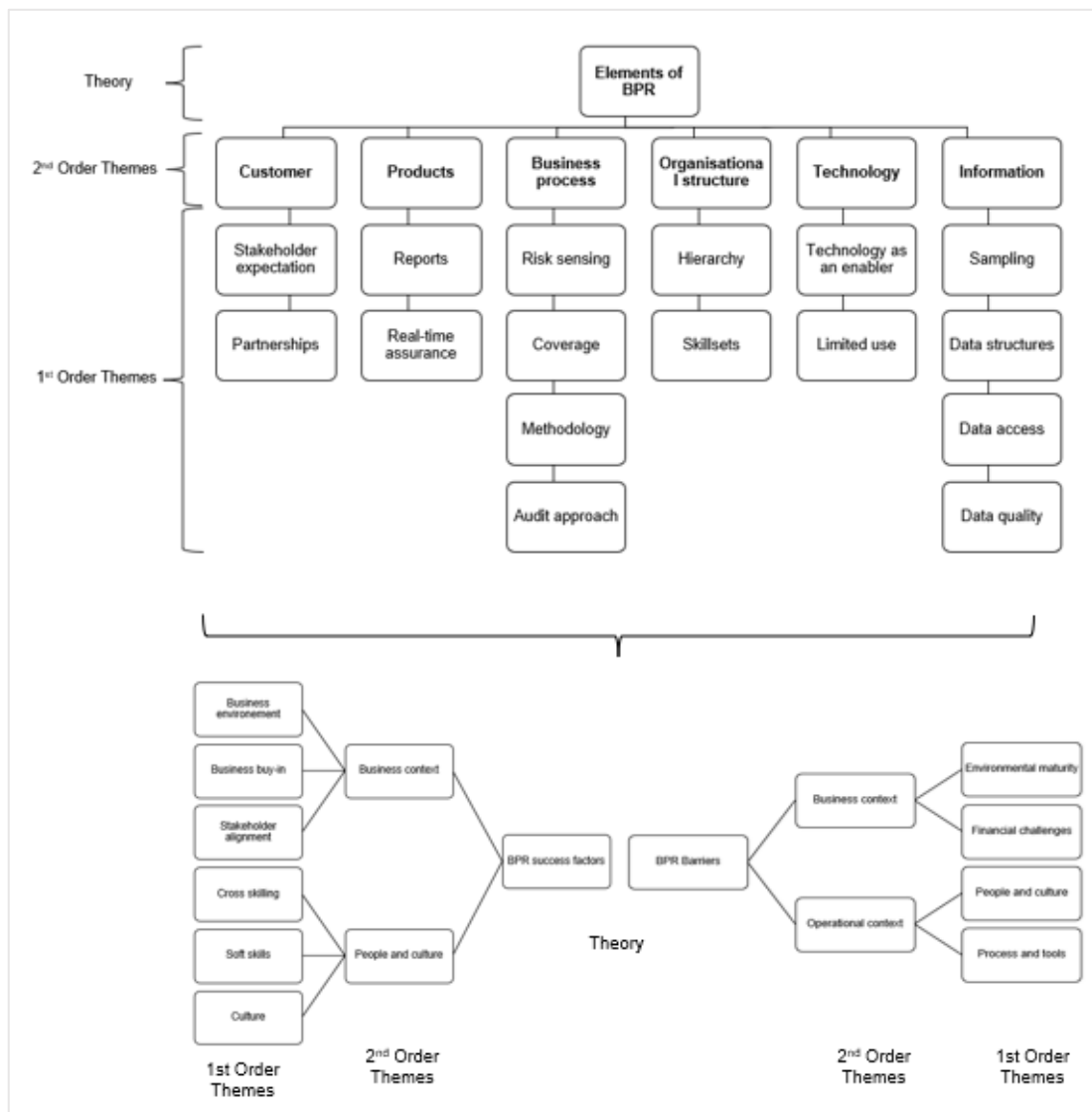
The chapter presented the results from the research questions outlined in Chapter three through the phenomenological data analysis process outlined in Chapter four. Although the results of the research were in contradiction to the literature underpinning this study, the need for change together with the expectations of what a transformed audit practice due to the influence of IAT has been uncovered.

Therefore, Figure 9 below summarises all three sub-research questions to answer the main research question, where the 1st order and 2nd order themes of the critical internal audit practices under the elements of BPR have been identified as the need for change and then the underlying success factors required in a change programme and barriers experienced that hindered change from occurring.

Chapter six will discuss the results against existing literature, as well as new literature which will be used to provide input into a proposed framework regarding internal audit change management due to the influence of IAT.

Figure 9

Summarised Results Answering the Main Research Question



6 CHAPTER 6: FINDINGS AND DISCUSSION

6.1 Chapter introduction

Chapter six provides a discussion of the main research question by discussing each of the sub-research questions, based on the lived experience shared by the sample group on the phenomenon of change due to the influence of intelligent automation technology on internal audit practices. The results from the research questions in Chapter five are compared against the extant literature presented in Chapter two in order to determine the redesigned audit practices in South Africa, with the aim of contributing towards existing literature relating to intelligent automation of knowledge workers and business process redesign in the service industry. Therefore, this chapter provides a summary of the findings that were identified under the main research question which are then discussed under each sub-research question.

6.2 Summary of findings

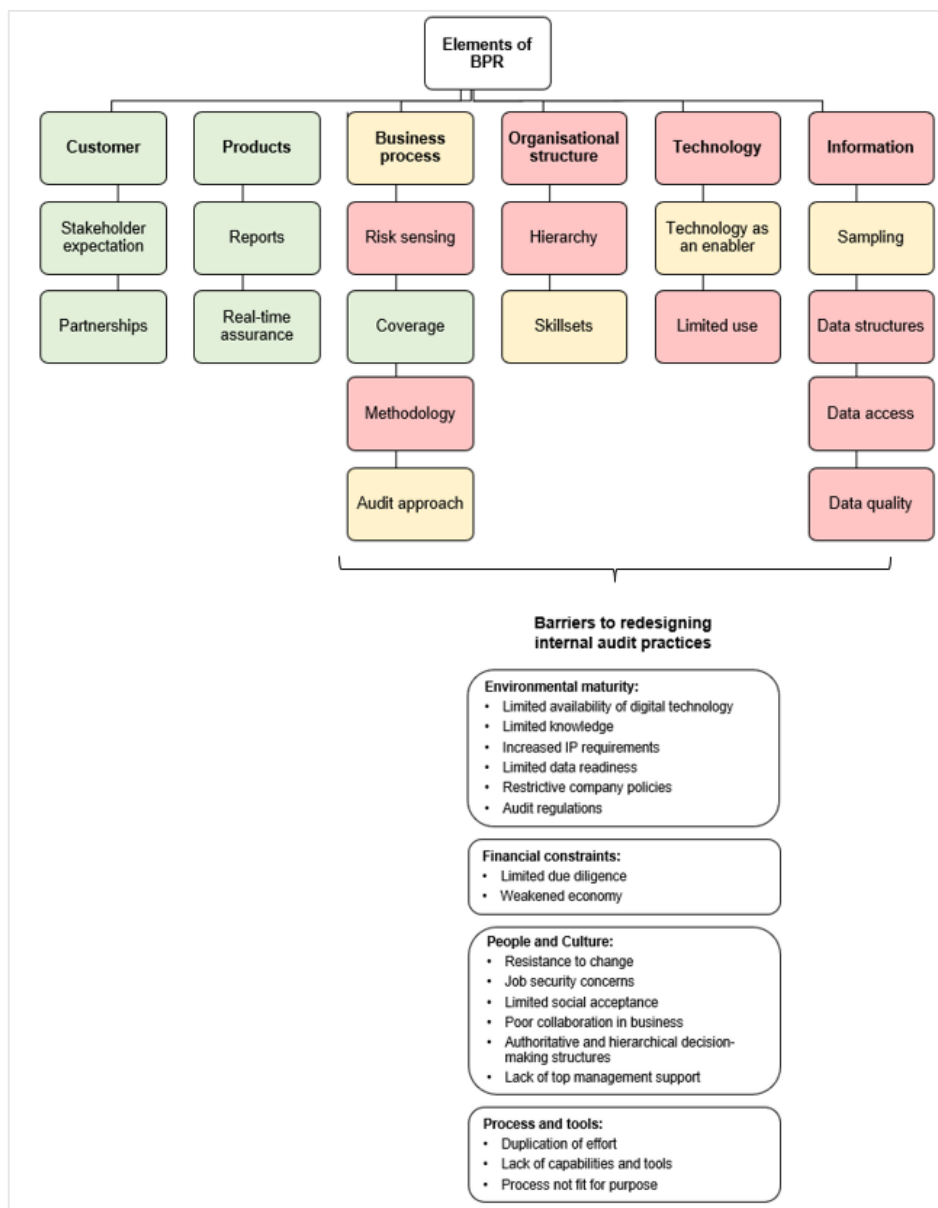
Based on the literature review, the researcher expected to uncover themes such as changed audit practices under the key themes of customers, products, processes, people, technology, and information. Therefore, upon conducting the research interview, the researcher inquired as to changed internal audit practices that have been experienced by research participants due to the influence of IAT. The predominant finding of the current study has been that internal audit has not significantly changed as the use of robotic process automation, artificial intelligence, and machine learning, collectively known as intelligent automation technology that would prompt the redesign of internal audit practices has been experienced to a limited degree.

The researcher then inquired as to the barriers faced in the use of IAT which would have created change management practices, specifically in a South African context as the unexpected discovery was that limited change in internal audit practices in South Africa has occurred, which means that barriers as to why change is occurring at a slower rate, or in instances, not at all, were discussed as opposed to barriers encountered during the change programme. The results shared also included potential enablers of change when redesigning internal audit practices which are perceived success factors and not experienced (lived/observed) success factors, which the researcher did not anticipate.

Therefore, based on findings from literature and mapped into the findings based on the findings from the interviews held, Figure 10 below which shows the elements that have been influenced and redesigned in green, elements where some change has been found in yellow and elements where limited or no change has been experienced in light red. The barriers that contributed to the limited changes and in instances no changes, have been discussed in a South African context, and have therefore been included to display the findings from literature and the results obtained.

Figure 10:

Summary of BPR Changes and Barriers to Redesign in South Africa



The current study has uncovered pertinent information regarding the implementation of BPR where the influence of IAT for knowledge workers in the service industry in South Africa will be of value. The study has also uncovered pertinent information contributing to the literature of business process redesign and redesign elements to be considered where the influence of IAT is to be adopted by knowledge workers in a service industry.

6.3 Discussion for Sub-Research Question one:

Which critical internal audit practices were redesigned to save on time and cost but increase quality and flexibility?

This question aimed to understand under BPR, which critical internal audit practices were redesigned based on the lived experience of senior internal audit leaders in the in-house (internal) and professional service firm (external) perspective. To answer this question, a general understanding of the participants professional background and years of experience was understood. A general experience of the phenomenon of change due to intelligent automation technology was then discussed. This allowed the researcher to identify similarities based on the background and context of the research participants lived experience of internal audit practices in South Africa.

6.3.1 Customer

According to BPR, customer centricity is at the heart of changing business processes (Borgianni et al., 2015; Frank et al., 2020). The themes identified in Chapter five that related to customer, included a change in stakeholder expectations where extended coverage over business risks was seen as the most important and customers experience of internal auditors has transformed to being a value adding partner.

The findings indicated that customers experienced internal audit as a business requirement to satisfy governance and reporting processes without understanding the redrived value for the business, however, the change experienced is the value that an internal audit practice provides which has changed to include customer satisfaction. Tsakalidis et al. (2019) explains that a derived competitive advantage in business process redesign is the aim of customer satisfaction.

Therefore, the balance of being independent while still adding value through increased trust with business which allows for increased customer satisfaction is a noted change and aligns to the definition of internal audit which is to provide independent objective assurance to add value and improve an organisation (The Institute of Internal Auditors, 2022a). Additionally, with increased expectations, increased pressures from a governance perspective are noted by stakeholders and as such the introduction of IAT and the use by internal audit is heightened. This finding is aligned with Brennan et al. (2019), where the importance of IAT for assurance providers includes the ability to be agile, flexible, and innovative due to increased governance pressures.

6.3.2 Product

The themes emerged from the results was the required need for reports to change, which is the key product provided to stakeholders, as well as the need for real time reporting. Direction (2021) indicated that redesign of products should be aligned to the expectations from customers, which in this case is the required change from internal stakeholders.

Gross et al. (2020) describes product-based designs as the flow of new products being created through a catalyst which in this case is the redesign of product offerings using technology. Therefore, the need for short reports with graphics being depicted which are easier to read was noted as a key change in the reporting process. The most notable change that the results provided was the concept of continuous monitoring, which is a real time exception monitoring audit that is a new product offering delivered through technology as it is used to test automated controls.

As real time auditing with results being reported in a timely manner with more graphics, the strategic importance of focusing knowledge worker efforts on key business elements is defined as a key element to generate capacity (Lacity & Willcocks, 2021). Therefore, to deliver on changed products due to IAT, the generation of capacity is a key element.

6.3.3 Business process

Under BPR, business processes are focused internally to drive process efficiency with reduced costs, with the aim of creating value (Frank et al., 2020). Much like the study conducted on how BPR was used to create a competitor advantage in knowledge workers such as engineers (Sunil Kumar & Harshitha, 2019), internal audit business processes in the form of the methodology followed in the planning, fieldwork, reporting and remediation steps has not changed which questions the competitive advantage of the perceived change.

The results indicated that the risk sensing of organisations is still performed annually with the only change being that coverage has now increased through sample testing moving to full population testing. Therefore, the value proposition of internal audit has increased and transformed to include further insights, meaning that the approach of assurance has changed partially where through technology, data is used to do target testing, however the method followed is static and as such process efficiencies have not been created.

The influence of IAT means that routine and repetitive tasks can be automated which increases capacity for knowledge workers to focus on strategic tasks (Violino, 2022). The business process of internal auditors which includes annual tasks such as risk sensing and manual sampling testing of controls, means that with the use of IAT, these tasks can be automated with focus then being on providing assurance over strategic business operations.

6.3.4 Organisational structure

The organisational structure of audit functions is still deemed to be hierarchical with an authoritative decision-making model, however skills are deemed to be changing to include more analytic and IT driven knowledge with a noted experience being the culture of the environment and learning platforms needing to be supportive and adaptive to the change being introduced which appears to be a future state and not a current state. This can be attributed to the requirements of the profession and standards, however in contradiction to the literature, roles are required to change to face business risks holistically in a digitalised business environment, which includes having a supportive culture (Moşteanu, 2020).

Additionally, with the influence of IAT, changes in job roles due to changed skills and competencies, work arrangements and new processes, creates significant team restructures (Goos et al., 2019), however as noted through the findings, internal auditors are yet to experience a shift in job roles and the way in which decisions are supported and made, meaning a hierarchical organisational structure still exists.

6.3.5 Technology

Research participants indicated that technology has been experienced as an enabler to perform uplifted internal audit activities, whereby manual files are now stored electronically and data is more in use to provide for greater coverage which was the expectation of stakeholders, however as the use of technology where the automation of tasks as described by Mansar & Reijers, (2007), is not being leveraged, and as such competitive service industries (Banica & Patricio, 2020) from an internal audit perspective has not matured.

Additionally, RPA and AI which is a key feature of the use of technology, and at a task level intelligent automation is essential (Coombs et al., 2020), however, is not in place and as such internal audit practices have not changed to incorporate even at a task level. This is supported by Rawashdeh et al. (2022) where the environment in which RPA is to be adopted in ternal audit functions needs to be ready. As such the findings indicated that although limited changes to the use of IAT is seen in the internal audit profession, the factors which hinder adoption includes the environment being not being ready. This is further discussed as part of the barriers to IAT adoption and hence a reduction in business process redesign and change implementation for knowledge workers.

6.3.6 Information

The way in which internal auditors use information has changed from sample testing to full population testing, however the question of data structures being adequate, ease of data access and data quality has been experienced by research participants to be barriers of BPR. As a key element of BPR is access to quality data that is credible (Vizzon et al., 2020), the implementation of BPR for internal audit practices is not feasible or practical.

Additionally, when gaps are identified through RPA or AI, the question of who is accountable for the error remains an open question. This is supported by Raji et al. (2020), where the need for accountability structures is as important as the information used. Furthermore, should the information be provided by the business, the way in which it is structured will provide results that internal auditors can anticipate as only specific tests can be executed on it, however, should the data be available in a format that can be independently extracted, detection based on data where additional anomalies can be identified is possible which coincide with findings from Nonnenmacher and Gómez (2021).

6.3.7 Summary of the discussion of sub-research question 1

The results of sub-research question 1 highlighted that some changes in accordance with the literature have occurred, such as the change in customer expectations and the need for changed products. However, the redesign of the audit methodology, organisational structure that includes roles and responsibilities and culture to enable change has not changed and is not in alignment with the literature. Additionally, the use of intelligent automation technology in audit practices and information available to redesign audit practices are in infancy stages with barriers to enablement from a South African context being discussed in sub-research question 3.

Therefore, the overall alignment of the results to the literature indicated that due to the internal audit practice changing with IAT at a slow rate and in some instances where no change has occurred, the need to understand why intentional change is not occurring at the same rate of what is expected through the lens of BPR is imperative.

6.4 Discussion for Sub-Research Question 2

What factors were considered successful in redesigning internal audit practices?

This question aimed to identify critical success factors that have been deemed as the practices companies need to perform to be successful when redesigning business processes (Freund, 1988). In this instance, the findings identified indicated that although BPR to has **not** been experienced by research participants, success

factors identified through their lived experience in the internal audit profession that **will** make for critical success factors in change management programmes will be discussed below.

6.4.1 Recommendations of success factors

The results of the findings included understanding the business context before embarking on a project which included an analysis of the level of automation in a business and if access to data is easily obtained. This is aligned with the requirement of having a feasibility study performed when embarking on a project, as indicated by Moeuf et al. (2020), which also includes ensuring access to data, as was noted as a key theme based on the results of the interviews. The importance of this step is to be able to design a map for BPR implementation as Ali Darwish (2011) indicated that a flawed map of implementation will result in a flawed process.

The theme of buy-in from stakeholders, clients, management, and teams as a success factor that was identified as a finding was identified as part of the literature review, where the World Economic Forum (2021) indicated that a critical success factor is putting people first and understanding the people performing and using of changed practices. However, the argument can be formed that to facilitate innovation, “free-thinking” as one research participant called it, excessive buy-in at all levels will hinder the process of innovative practices being developed, which was identified as a barrier to change (Vizzon et al., 2020). This is in line with success factors not only being IT related but inclusive of stakeholders, communication, and governance, which aligns with Ravesteyn and Batenburg (2010).

Moeuf et al. (2020) highlighted that due to the introduction of Industry 4.0 and hence the influence of IAT the importance of communication with stakeholders, manager networks in terms of high priority business operations and strategy changes and sourcing the rights skills even through cross-skilling programmes are critical success factors in change programmes. The findings from the research conducted, aligned to this requirement, were the theme of stakeholder alignment and soft skills such as the importance of communication, cross-skilling programmes and networking were identified as critical success factors.

The last key theme identified as a success factor was the culture of internal audit needing to move to a futuristic state where ESG is considered to ensure sustainable practices of a company and the profession in how it conducts audits. Correspondingly, Ghobakhloo et al. (2021) aligned that the value drivers required of an Industry 4.0 practice is one in which focuses is on higher economic performance through sustainability and not only financial performance.

Therefore, the success factors required when implementing a change programme, specifically when influenced by IAT, is to be outward looking from the project which includes the environment, stakeholders, people, culture, and sustainability elements.

6.4.2 Summary of the discussion of sub-research question 2

The findings of sub-research question 2, highlighted that understanding the business context, aligning with stakeholders, ensuring adequate skills, and focusing on the softer skills such as communication, networking and ensuring a futuristic culture are deemed as critical success factors. This is supported by the findings of literature where value drivers and success factors have been discussed.

The concept of buy-in is an interesting discussion point as the findings indicate that buy-in from all levels are a key success factor, however the findings from literature do not support this concept and indicates that excessive buy-in stifles innovation and creativity in a BPR project (Vizzon et al., 2020).

In the context of internal audit practices, the profession has transformed to become value adding (Eulerich & Eulerich, 2020), however the regulatory nature of South Africa due to the requirements set out in King IV Report on Corporate Governance and the Institute of Internal Auditing Standards that govern the profession, there is little room for creativity and innovation (Fourie, 2014).

6.5 Discussion for Sub-Research Question 3

What factors were considered barriers to redesigning internal audit practices?

The aim of the research question was to understand what barriers have been experienced when implementing business process redesign in internal audit practices that have been influenced by intelligent automation technology. Based on

the findings of the results, it was identified that internal audit practices have not fundamentally been redesigned and as such the experience of barriers when implementing redesign activities have not been explicitly observed.

The researcher then sought to understand the reasons for the slow rate of change of internal audit practices in South Africa, as contrary to the findings of literature, IAT has been used to redesign and transform internal audit practices in multiple ways (Bäßler & Eulerich, 2022; Kuenkaikaew, 2013; Lal Joshi & Marthandan, 2020; Landers & Behrend, 2022). The findings of the results indicated that barriers faced when embarking on changing internal audit practices in South Africa include a multitude of reasons as to why change often occurs at a slow rate or in certain instances, not at all. The following barriers have been identified as findings, which is discussed through the lens of literature.

6.5.1 Environmental maturity

Aghimien et al. (2022) defines the context of South African businesses in a state of early adoption of technology which is the causal effect of the “non-availability of needed digital technologies” (p.9) in South Africa, due to the complex nature of technologies needed where knowledge is limited. Furthermore, Akinradewo et al. (2022) emphasises that specialised technology such as blockchain technology has increased intellectual property concerns, limiting the use in the South African built environment.

The findings from the research indicated that the business environment in some instances is not technological mature and as such operations are seldom data ready. This includes restrictive business policies as to how information can be used and stored, which is further accelerated by limiting audit regulations that expect assurance to be provided in a certain way, which becomes a cycle of audits being performed at an operational and not the expected strategic level where through the influence of IAT greater insights can be provided. A potential reason for this occurring as described by Fehrer et al. (2022), is that redesign practices occur in isolation to business and people who will be impacted, resulting in implementation failures.

6.5.2 Financial challenges

A key barrier in implementing change is the question of costs and the lack of budget being available to acquire needed technology and associated skills. Barmuta et al. (2020), deems this as one of the strongest barriers and while Aghimien et al. (2022) found that not only the cost of acquisition, but the cost of maintenance is a barrier to technology adoption in South Africa is a factor, the findings from the results indicated that due to internal audit functions being seen as a support function, budgets to acquire and maintain technology to enable change is often unrealistic. Apart from that, adequate due diligence in terms of full anticipated costs is not adequately performed, resulting in halting implementation until funds are available. This is aligned to the front-end assessments that need to be carried out to ensure a response to problems when they occur is in place (Torp et al., 2004).

Additionally, Fotso et al. (2022) characterised South Africa as having severe macroeconomic imbalances such as a high unemployment rate, poverty, inequality and fragile fiscal, which is exacerbated by low foreign investment and declining economic growth. This means that cost of acquisition of certain technologies and the cost to maintain such technologies becomes worse for businesses and even more dire for support services within a business. As such, the need for change remains evident, however the ability to plan and execute on change requirements remains stagnant until a budget is available.

6.5.3 People and culture

Vizzon et al. (2020) described key barriers to limiting change practices in BPR as people and cultural barriers such as resistance to change, lack of buy-in of transformed processes and lack of top management support. In a South African context, this is further exemplified by Akinradewo et al. (2022), whereby audit concerns in terms of not knowing how to audit specific systems, coupled with poor collaboration within business departments as well as limited social acceptance by employees of changed programmes create barriers to redesign initiatives.

The research findings indicated that resistance to change by personnel in internal audit is high as many tenured employees are rigid and don't buy into the vision of changing practices. Additionally, in a South African environment, where a third of the

workforce population is unemployed (Statistics South Africa, 2022), resistance to change is created through the fear of job losses, which is anticipated due to the negative influence technology has on human employment opportunities (Kim et al., 2017).

Furthermore, the research findings indicated that due to the hierarchical structure of internal audit organisations, the encouragement of innovative ideas are stifled. This is coupled with organisational top management support being focused on prioritising work performed by other assurance providers, leaving internal audit practices without the required support, which is a known barrier for South African businesses, according to Akinradewo et al. (2022).

6.5.4 Process and tools

The findings of the research indicated that duplication of the use of tools and existent skills has been identified as a barrier to change, because internal audit functions are unaware of what business tools are being used which limits the objective of change practices. This is explained by Fehrer et al. (2022), where common failures occur when processes are designed without taking business context and existing processes into account. Furthermore, Ghobakhloo et al. (2021) emphasises that a pitfall experienced is when companies fail to include external stakeholders in the redesign process. Although not indicated from the results of the research, the external environment is a key determinant in the success of redesign practices as noted in the discussion of sub-research question 1 and sub-research question 2.

Additionally, key barriers to redesign that was identified from the findings of the research indicated that with a lack of capability which includes the tools, policies, technologies and time, the barriers to redesigning processes have increased. Akinradewo et al. (2022), explains that digital tools used in developing markets are more susceptible against information attacks due to the lack of an available processing pool and together with this, the technology governance, in block chain for instance is decentralised so authority over technology is in question, specifically where it is replicated in organisations.

6.5.5 Summary of the discussion of sub-research question 3

The findings and discussion of sub-research question 3 indicates that barriers to redesigning internal audit practices in South Africa include environmental, financial, people, process, and tools in the form of technology. The discussion of these barriers from a literature perspective indicated that upon embarking on a redesign initiative, a step that is critical for South African operations is the understanding of the environment at a macro level and the challenges faced which will hinder implementation of a to-be process.

Mansar & Reijers, (2007) categorises the external environment as a consideration for all other factors, other than customers when implementing a redesign process, however the findings above indicate that before embarking on a redesign project, a number of considerations from a South African environment perspective is to be considered.

6.6 Overall discussion of the main research question

Main Research Question: How has the adoption of intelligent automation technology influenced business process redesign of internal audit practices in South Africa?

Gross et al. (2020) refers to BPR as the intentional change of business processes. Mansar & Reijers (2007) describes this intentional change as “more of an art than science” (p.193), where Vizzon et al. (2020) exemplifies that improved business processes support a company’s competitiveness and sustainability. Internal audit practices which are a value adding activity to a business (Eulerich & Eulerich, 2020) has been no different and empirically proven to have transformed due to the introduction of technology and through the use of technology, the way independent assurance is provided has thus changed (Arnold, 2018; Christ et al., 2021).

Through this lens, the researcher sought to understand how BPR has been implemented in internal audit practices in South Africa, with the aim of creating a framework of critical practices that are redesigned, together with the success factors and barriers experienced in the design. The objective of the framework was to add to the body of knowledge in BPR where the influence of IAT on knowledge workers

in the service industry is noted and assist maturing internal audit practices that are adopting technology with the implementation of redesign programmes.

The findings from the current study indicate that internal audit practices have been redesigned in certain areas to meet rising customer expectations and have identified ways in which to further evolve and redesign processes to support the competitiveness and sustainability of business. However, multiple barriers in a South African context exist that prohibits the full extent of the influence of IAT to be used to be able to redesign internal audit practices, due to the uniqueness of the organisational, societal, and technological barriers experienced (Akinradewo et al., 2022).

Overall, the framework created by Mansar & Reijers (2007) is applicable to the extent that implementation of BPR is guided through six critical elements that should be considered when applying a BPR implementation project, however a key finding in a South African context, is the external environment that needs to be considered prior to beginning any BPR implementation projects. As part of the framework created by Mansar & Reijers, (2007) the external environment that is considered in a change programme refers to all other aspects apart from customers, such as suppliers and competitors, however, this is a consideration during the implementation of redesign processes. From a South African perspective, the external environment is a key consideration before even embarking on a redesign project.

6.7 Chapter summary

Chapter six provided a discussion of the findings from the results obtained in Chapter five, which was compared against extant literature in Chapter two. Although some of the findings were supported by extant literature, most of the findings indicated that in a South African context, change implementation is more complex due to increased barriers from an organisational, societal, and technological perspective and as such the phenomena of changed internal audit practices has not been fully experienced.

Therefore, for internal audit practices, a key step before embarking on a redesign process is to understand the barriers and constraints through adequate due diligence of the macro-environment and micro-environment, which will enable greater success

of implementation. The following chapter provides a conclusion of the current study and presents an adapted framework to BPR implementation for internal audit practices in South Africa, which will include critical success factors for implementation that may aid maturing practices that are redesigning internal audit practices in South Africa.

7 CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Chapter introduction

The study aimed to determine how intelligent automation technology influenced the redesign of internal audit practices in South Africa and the critical success factors and barriers that were experienced during the implementation of the change, in order to be able to leverage change implementation and redesign practices in the service industry.

The need for this study has been underpinned by the transformation businesses have undergone due to the influence of intelligent automation technology and the associated change that has been required from assurance providers. Therefore, in order to support assurance providers that are embarking on redesigning a 'to-be' process due to the influence of intelligent automation technology or who are currently undergoing change management and redesign programmes, this study aims to provide a framework to be considered in redesigning internal audit practices in South Africa.

Chapter six provided a discussion of the results of each sub-research question to answer the main research question against extant literature. In Chapter seven, a summary of the principal findings of the research will be highlighted, including a framework for critical internal audit practices that are to be considered in redesigning internal audit practices, the successful practices to be used and barriers to be aware of that might hinder successful implementation of a change programme. The implications for functions that offer business support in the service industry where the principles of BPR implementation in South Africa can be leveraged are also presented, followed by the key limitations of this study and suggestions for future research.

7.2 Principal research findings

The study was successful in determining the rate of change of internal audit practices in South Africa due to IAT. The study was also successful in determining how effective BPR implementation has been in redesigning internal audit activities, with the key finding being that due to the influence of IAT, internal audit practices in South

Africa have been slow to redesign business processes and, in some instances, have not fundamentally redesigned internal audit practices.

The BPR framework used to underpin this study by Mansar & Reijers, (2007) revealed that although effective in providing consideration when implementing a change programme, the South African environment is unique and without adequate due diligence processes to evaluate the organisational, social and technology landscape of the business environment in which change is to be implemented, BPR will not be successful and as such internal audit practices have seen limited changes.

The key findings have been illustrated in the framework for BPR implementation in internal audit practices in South Africa in Figure 11.

7.2.1 Critical internal audit practices that were redesigned

Through the study, participants identified that some internal audit practices have been redesigned with intelligent automation technology, whereas most practices are slow to change, and some have not changed at all due to barriers experienced in sub-research question 3 below.

The practices that have changed under each element of BPR implementation, as well as practices where limited change has occurred and those that have not changed at all are explained in further detail in Table 7 below. The categorised colours are linked to Figure 10 for consistency, where green indicates changed internal audit practices, yellow indicated partially changed practices and red indicates no change in internal audit practices.

Table 7

Critical Internal Audit Practices That Were Redesigned

BPR element	Theme	Description
Changed practices		
Customer	Stakeholder expectation	The experienced change has been an increase in stakeholder experience where more assurance is required from the internal audit practice.

BPR element	Theme	Description
	Partnerships	With the increased expectations, the partnership with business has grown, where internal audit is now seen as a value adding partner, rather than a governance and reporting requirement which has increased customer satisfaction.
Products	Reports	The experienced change has been the way in which results from audits are being presented to internal stakeholders. this included more dashboarding reporting with graphics and shorter reports that are less wordy.
	Real time assurance	A key change experienced is the introduction of a new product called continuous audit monitoring, which is real time exception monitoring audits being performed with immediate results being communicated on weaknesses found.
Business process	Coverage	Due to full population testing being experienced, instead of sample testing, the coverage of risk areas has changed to be wider and more encompassing.
Limited change in practices		
Business process	Audit approach	Limited change has been experienced as the approach to performing assurance reviews have changed to targeted testing using data to provide indicators where weaknesses may exist, however process efficiencies have not been created as the method followed is still static.
Organisational structure	Skillsets	Skillsets are changing to include more IT and data driven knowledge; however, the culture of the environment and learning is still to be developed limiting the full spectrum of skillsets required.
Technology	Technology enablement	Technology has been experienced as an enabler whereby manual files are now stored electronically on a platform and data is more in use to provide for greater coverage.
Information	Sampling	From limited sampling to full population testing, the information provided by systems have changed minimally due to the question around data quality and access.
No change in practices		
Business process	Risk sensing	The performance of business risk sensing is still being completed on an annual basis with room for ad-hoc requests, however no change has been experienced in how this is performed.

BPR element	Theme	Description
	Methodology	No change in the methodology of internal audit has been experienced. Therefore, the key steps of planning, fieldwork, reporting and remediations are the same.
Organisational structure	Hierarchy	The decision-making structure of internal audit practices still appear to be hierarchical with an authoritative decision-making model.
Technology	Use of technology	The full use of technology such as RPA and AI are not being used in internal audit practices. Additionally, the automation of internal audit tasks has not been performed using technology.
Information	Data Structures	These three themes are covered together as the theme that was extracted included the fact that information provided by businesses appear to be instructed which cause a data quality concern as access to the appropriate sources, fields and periphery data is not in place. Therefore, no change in how data is being used has been experienced.
	Data access	
	Data quality	

The identified changes in internal audit practices align closely to the constructs of BPR, however for an effective implementation to occur, all constructs need to be considered with operational viability. As internal audit research participants did not experience significant business process redesign programmes, the barriers as to why this has occurred from a South African context was discussed in more detail together with that would be considered success factors upon implementation of a BPR programme in internal audit practices.

7.2.2 Success factors required when implementing change

As fundamental change has not been experienced by research participants in business process redesign of internal audit practices influenced by IAT, success factors that ***should*** be considered when implementing a change programme were identified. Table 8 below includes the themes identified.

Table 8*Success Factors Required When Implementing Change*

Theme	Description
Business environment	A feasibility study should be performed internally in a business, which includes an analysis of the business context whereby the level of automation and accessibility of data needs to be understood.
Buy-in and support	The key theme of obtaining buy-in from all levels of engagement internally has been noted as part of the findings, however although literature could not explain the causal relationship to BPR, research participants in an internal audit practice deem it to be a success factor.
Stakeholder alignment	Stakeholder alignment is achieved through greater communication with stakeholders, manager networks in terms of high priority business operations and strategy changes and sourcing the right skills even through cross-skill programmes to ensure the best fit is available. These themes are supportive of each other to encourage change when BPR is implemented.
Cross skilling	
Soft skills	
Culture	The value driver for an Industry 4.0 internal audit practice is the culture shift to a futuristic state that includes sustainability efforts in how internal audit services are provided and how it is audited in a business to achieve higher economic profits.

The themes above are categorised based on the constructs of business context, which includes the business environment, business buy-in and stakeholder alignment and the construct of people and culture, which includes, cross-skilling, soft skills, and culture.

7.2.3 Barriers in redesigning internal audit practices in South Africa

As fundamental change has not been experienced by research participants in business process redesign of internal audit practices, barriers experienced were due to the inability to implement BPR and not during implementation.

Table 9 below includes the themes identified as to why change often occurs at a slow rate, or in certain instances, not at all in BPR of internal audit practices in South Africa.

Table 9*Barriers in Redesigning Internal Audit Practices in South Africa*

Theme	Description
Environmental maturity	On a macroeconomic level, South Africa is in the initial stages of technology adoption due to the complexity of technology needed and associated skills. Therefore, the emergent theme included businesses not being technologically mature and as such operations are not data ready. This restricts the rate at which internal audit practices can be redesigned due to intelligent automation technology.
Financial challenges	The critical barriers faced in implementing BPR in internal audit practices are unrealistic budgets being set, where the cost of acquiring and maintaining required technology is underestimated. A major contributing factor is the lack of adequate due diligence processes from a financial standpoint resulting in halting operations. The worsening economic climate of South Africa and the macroeconomic imbalances created increased financial distress especially when the design is occurring in a support service area of the business.
People and culture	People are inherently resistant to change, even more so when a perceived threat to their employment is in question. Additionally, lack of buy-in for redesigned processes and top-management support are barriers experienced. Additionally, due to the hierarchical nature of internal audit organisational, innovation, which is a key component of technology, is stifled due to the number of approvals required.
Process and tools	Duplication of tools and existing skill sets have been identified as a barrier to implementing BPR in internal audit practices. This often occurs in the business where no oversight is available by the audit team. Additionally, there has been a lack of capacity, tools, policies, and time to create and invest in redesign initiatives.

The themes above are categorised based on the constructs of business context, which includes the environmental maturity and financial challenges and the construct of operational context which includes people and culture and process and tools which have been highlighted as key barriers to implementing BPR in internal audit practices.

7.2.4 Adapted framework for BPR implementation in South Africa

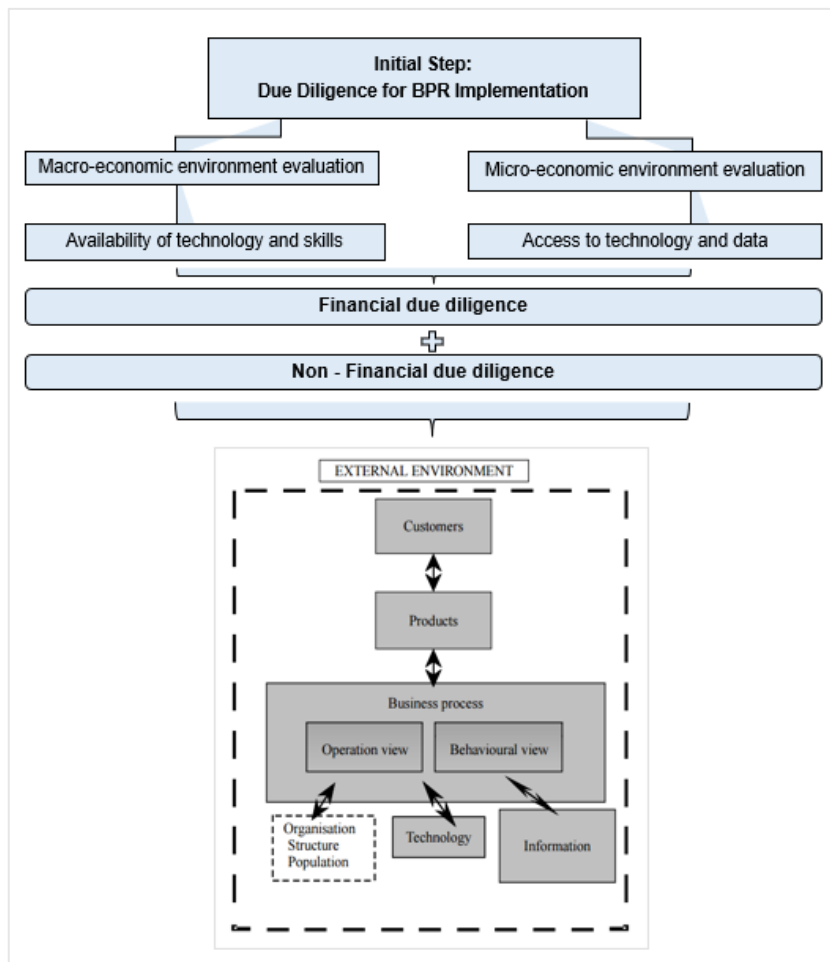
The study found that the BPR implementation framework created by Mansar & Reijers (2007) is applicable when considering key elements in a BPR project. However, as South African internal audit practices are yet to experience a full BPR implementation, the model has been adapted to introduce a step that is for consideration at the conceptual stages of BPR implementation. The importance of this step as highlighted through the findings and discussion, is that BPR implementation for internal audit practices is key to ensuring the relevance of the profession to business, however, if performed incorrectly, the profession becomes stagnant in change implementation practices, especially when intelligent automation technology is in use. Therefore, performing a full assessment of the macro and micro environment before any BPR programmes can be undertaken is fundamental in ensuring a successful implementation of change practices.

Therefore, a due diligence step must be completed before BPR can be implemented in support functions in a service organisation. This step needs to evaluate the macro-economic conditions of South Africa, the micro-economic conditions of the company, the skills, and tools currently in use together with the type of data generated, together with the quality and accessibility of such data.

The due diligence process then needs to extend to evaluate and cover the true cost of technology implementation from a financial standpoint and from a non-financial standpoint, which includes the knowledge required, the current culture and sensitivities to change, job security concerns and the need for time and space to be innovative. Therefore, the BPR framework has been adapted to include a due diligence step that is highlighted in blue that should be completed ahead of BPR feasibility studies in Figure 11 below.

Figure 11

Adapted Framework for BPR Implementation in South African Internal Audit Practices



Source: Author Adapted from Mansar & Reijers (2007)

7.3 Implications and recommendation

7.3.1 Implications for support functions in the service industry

The study has provided insights into barriers that hinder BPR implementation for internal audit practices in South Africa. Therefore, evaluating such barriers should be performed as the due diligence step before BPR feasibility studies are undertaken. This will allow for internal audit practices to evaluate the realistic achievement of implementation as well as the true derived impact based on the objectives of changed audit practices. Additionally, critical internal audit practices that require change have been highlighted in this study, together with critical success factors that should be considered in a redesign programme relating to internal audit practice change.

7.3.2 Recommendations for business

Assurance providers are seen as integral governance pillars of an organisation, therefore better understanding of the critical practices undertaken by internal audit practices and the support required to adapt, transform, and change with business is required. When a support function within an organisation feels supported, their commitment levels to meet and exceed expectations through more coverage of risks, increased real time reporting, and innovative real time results presentation will be ensured. Businesses can therefore better leverage support functions to provide greater insights and deeper support.

7.4 Limitations of the research

Queirós et al. (2017) indicated that when an exploratory, qualitative research study is undertaken, generalisation of the results exists. As 16 participants were interviewed, which is a small sample size compared to the population of internal audit practices, the study aimed to obtain richness in insights through data being obtained from internal and external senior audit practitioners across multiple sections that have experienced the phenomenon of change due to intelligent automation technology, however, research participants interviewed coincidentally were all from the financial services and insurance industry. The study was also performed in a South African context which is deemed as a developing market, which could serve as a limitation in the applicability of findings outside of the South African context.

As the researcher is in the internal audit profession, researcher bias which is described by Queirós et al. (2017) as assumptions applied when selecting research participants, exists. The researcher, therefore, set out their lived experience of the phenomena of the change noted in the internal audit practice and ensured that neither confirmation nor denial of information shared by the research participants occurred. Post-interview checks were also held with research participants to ensure the responses were adequately interpreted.

Regarding qualitative interviews, a possibility for subject bias exists in the way the questions could have been framed in terms of whether the questions were open-ended or not to allow participants to share their views openly (Merriam & Tisdell, 2015). The researcher's interpretation of participants' responses and the analysis of

the results may have also served as a limitation, together with the fact that the findings obtained were at a point in time and cannot infer changes to the internal audit practices post the discussions held.

7.5 Recommendations for future research

A new insight emerged with respect to BPR practices in South Africa which included the organisational, societal, and technological landscape of the macro-environment and micro-environment where change practices are to be implemented. Therefore, due diligence processes in these areas are to be performed before any change in practice can occur. The emergence of these critical elements in BPR and how it relates to support functions in the service industry needs to be addressed in depth. Due to the rising economic concerns in South Africa and globally, there is an urgency for future research in this area.

For the purposes of this study, little attention was given to alternative phenomena of change outside of intelligent automation technology in internal audit practices. A point for future research is the investigation of barriers to change in other professions, outside of assurance and governance, which support business objectives and are not limited to intelligent automation technology.

As this study was performed qualitatively to understand the phenomena of redesigned internal audit practices due to the influence of intelligent automation through the lived experience of internal audit professions, the testing of relationships of the proposed framework for other professions quantitatively to assess the impact of effective due diligence impacts on a BPR programme is an area for future research.

The organisational perspective of implementing BPR was not obtained through this study, therefore an exploratory study could be conducted to determine other factors that were considered barriers to BPR implementation.

7.6 Conclusion

The purpose of the current study was to build on existing literature relating to business process redesign and the phenomena of redesigned internal audit practices due to the influence of intelligent automation in South African internal audit practices. This study offers practical insights to knowledge workers in the service industry, specifically internal audit practices that may plan on redesigning internal audit practices due to the influence of IAT, together with practical insights into success factors and barriers noted in redesign programmes.

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ANNEXURES

Annexure 1: Interview Guide

Introduction

This study is on internal audit practice development in South Africa. The study aims to understand how internal audit practices have been redesigned due to the influence of intelligent automation technology and what success factors and carriers have been experienced in the redesign.

The title of the research project is:

“Redesigning Internal Audit Practices in South Africa: Understanding the influence of intelligent automation technology on internal audit practices”

The purpose of the interview is to have a conversation based on the interviewee’s specialist knowledge and life experiences, which will allow the researcher to gather information about which internal audit practices have been changed due to intelligent automation technology, the critical success factors used in the implementation of the change programme and barriers experienced during the change.

The significance of this study is to add to the body of knowledge on the relatively understudied topic of business process redesign and internal audit practice development, with specific context to South Africa.

The interview will be conducted in a semi-structured manner, which will allow for a discussion as opposed to prescriptive questions.

Background information and context	
Interviewee information	Please state the following: • Job title • Reporting line • Years of experience • Are you currently in an Internal Audit Function (IAF)? • How many IAFs have you been part of?
Internal Audit Function Information	Please state the following: • How many staff members are in your IAF?

	What is the approximate split between IT audits and business process audits on the Internal Audit Plan?
Interview questions (45 minutes)	Probes / Discussion topics for the question
Question 1: Before the introduction of intelligent automation technology, what was the internal audit process in place?	Before the introduction of intelligent automation technology which is underpinned by RPA, AI, and ML, what was the experienced internal audit process like? How was the testing of controls performed, what was the internal audit methodology and how was the audit methodology applied, specific to the defined internal audit methodology per the following areas: - Environmental Risk assessment - Internal Audit Planning - Fieldwork - Reporting - Remediations
Question 2: What key features in the internal audit process have been redesigned due to the introduction of intelligent automation technology?	With specific consideration to IAT, which is RPA, AI, and ML, which internal audit processes were redesigned across the six elements of BPR as follows: - Customer - Product - Business Process - Organisational structure - Technology - Information
Question 3: In your experience, what successful factors were followed in redesigning internal audit processes?	What were success factors identified that could be marked as a must-have when redesigning internal audit practices?
Question 4: In your experience, what barriers were faced in redesigning internal audit processes?	What barriers were identified that could be marked as flags when redesigning internal audit practices?

Annexure 2: Informed Consent Statement



Informed consent letter

My name is Subhadra Ragubeer, and I am currently a student at the University of Pretoria's Gordon Institute of Business Science and completing my research in partial fulfilment of an MBA.

I am conducting research on internal audit practice development in South Africa and how intelligent automation technology has changed the audit process. I am trying to find out how internal audit practices have been redesigned due to the influence of intelligent automation technology and what success factors have been used as well as barriers experienced in the redesign.

Our interview is expected to last about an hour and will help me gather themes to support my objective as aforementioned. **Your participation is voluntary, and you can withdraw at any time without penalty.** All data will be reported without identifiers and will be treated with confidentiality. Your name or any mentioned company name will not be reported in my findings. If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher	Research Supervisor
Name: Subhadra Ragubeer	Name: Jefferson Yu-Jen Chen
Email: 27237096@mygibs.co.za	Email: chenj@gibs.co.za
Phone: (+27) 072 061 1696	Phone: (+27) 011 771 4304

Signature of participant:

Date:

Annexure 3: Sample of Informed Consent Statement shared via email

File Meeting Scheduling Assistant Tracking Insert Draw Format Text Review Help

Cancel Meeting Copy to My Calendar Forward Join Teams Meeting Options Send to OneNote Contact Attendees Address Book Check Names Response Options Show As: Busy Recurrence Reminders: None Categorize: Private High Importance Low Importance Tags Dictate Immersive Reader

Attendee responses: 1 accepted, 0 tentatively accepted, 0 declined.

Send Update From Title: GIBS Masters Research | Subhadra

Required

Optional

Start time: Mon 2022/08/22 12:30 [Calendar Icon] [Dropdown] ☐ All day ☐ Time zones

End time: Mon 2022/08/22 13:30 [Calendar Icon] [Dropdown] [Make Recurring](#)

Location: Microsoft Teams Meeting

Informed Consent Letter_Research Participation.pdf .pdf File

Hi

Thank you for being willing to participate in my Masters research.

A requirement in partial fulfillment of the degree, is to conduct research on a topic of value and being in the audit profession, I wanted to understand how Internal Audit has changed due to technological advancements through the lens of Senior Management / Executive experience and what best practices have been used to facilitate the change.

There is no prep work required as I have 4 questions to guide the discussion.

I have also attached an informed consent letter that details the confidential nature of the interview.

I have scheduled for next Friday as I will be working off site next week.

Please let me know if this time is unsuitable and happy to rearrange according to diary on the 19th or anytime thereafter.

Many thanks

Subhadra

Annexure 4: Ethical Clearance Approval Form

**Gordon Institute
of Business Science**
University of Pretoria

**Ethical Clearance
Approved**

Dear Subhadra Ragubeer,

Please be advised that your application for Ethical Clearance has been approved.
You are therefore allowed to continue collecting your data.
We wish you everything of the best for the rest of the project.

[Ethical Clearance Form](#)

Kind Regards

This email has been sent from an unmonitored email account. If you have any comments or concerns, please contact the GIBS Research Admin team.

Annexure 5: Code Book

TRD: Traditional Practices	CHG: Confirmation of change	SUF: Success Factors
Planning - Business Process	Planning - Business Process	SUF: Buy-in
TRD: Risk sensing	CHG: Approach	SUF: Implement digitisation
TRD: Proposal for work	CHG: Audit itself	SUF: Understand context
TRD: Engagement letter	CHG: Audit Plan	SUF: Adequate coverage
TRD: Internal Audit Plan	CHG: Business	SUF: Cross-skill
TRD: Period of review - coverage	CHG: Risk sensing	SUF: Culture
TRD: Process driven audits	CHG: Coverage	SUF: Role education
TRD: Coverage	CHG: Digital Audit Methodology	SUF: Priming of stakeholders
TRD: Methodology + Process	CHG: Proposal for new work	SUF: Networks
Fieldwork - Information	CHG: Reduced cost	SUF: Providing challenge
TRD: Manual samples	Fieldwork - Information	SUF: Teamwork
TRD: Manual testing	CHG: AI	SUF: Training
TRD: Point in time	CHG: Data driven	SUF: Value creation
TRD: Limited coverage	CHG: Sample	PITF: Pitfalls
Reporting - Products	CHG: Real time	PITF: Inadequate budget
TRD: Lengthy	CHG: Automated	PITF: Staff continuity
TRD: Retrospective	CHG: Continuous	PITF: Wrong culture
Remediations - Product	Reporting - Products	PITF: Duplication of effort
TRD: Manual Rems	CHG: Real time	PITF: Arrogance
People - Org Structure	CHG: Report results	PITF: Hierarchical team
TRD: Hierarchical	CHG: Deeper insight	PITF: Lack of mandate
TRD: Skill - Limited skill	Remediations - Product	PITF: Methodology ridged
TRD: Authoritative tone	CHG: Real time	PITF: Not aligned to business
TRD: Skill -Generalist	People - Org structure	PITF: Performing ops audits
TRD: Trust equation (Watchdog)	CHG: Auditor Skill	PITF: Regulator not on board
Customer	CHG: Uplifted Role	PITF: Not aligned to business
TRD: Stakeholder expectations	CHG: Credibility	PITF: Standards
Technology	CHG: Depth	PITF: Stick approach
TRD:Tickbox	CHG: Education	PITF: Lack of buy in
CHG: Limited change	CHG: Holistic auditor	PITF: IA immature
LtdCHG: Approach	Customer	PITF: Business is not mature
LtdCHG: Sampling	CHG: Org structure	
LtdCHG: IA Plan	CHG: Partnership	
LtdCHG: Risk assessment	CHG: Stakeholder expectation	
LtdCHG: Skills	Technology	
Ltd:CHG: Agility	CHG: System	
CHG: No change	CHG: Authority	
NoCHG: Methodology	CHG: Tech	
NoCHG: Rate of business	CHG: Co-Source	
NoCHG: 3 Lines of defence	CHG: Continuous Auditing	
NoCHG: Planning	CHG: Cyber	
NoCHG: Risk assessment	CHG: Data Analytics	
NoCHG: IA judgement	CHG: Synchronise maturity to business	
NoCHG: Divide in skills	CHG: Combined Assurance	
	CHG: Robotics	