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The role of AI in the accounting profession: opportunities and threats

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Abstract

Diese Arbeit versucht, potenzielle Anwendungen von künstlicher Intelligenz im Rechnungswesen aufzuzeigen und Einblicke der beteiligten Akteure in eine Zukunft des Rechnungswesens zu geben, in der sich menschliche und technologische Fortschritte aktiv ergänzen können.

Das Forschungsdesign der Arbeit ist qualitativ und querschnittlich. In der Arbeit werden halbstrukturierte Interviews verwendet, um direkte Einblicke von den Zielgruppen zu erhalten. Zu den Forschungsteilnehmern gehören Fachleute aus dem Rechnungswesen und der IT sowie Führungskräfte aus dem Rechnungswesen, die bereits Erfahrungen mit KI-Tools an ihrem Arbeitsplatz gesammelt haben. Insgesamt wurden 15 Interviews im Juni und Juli 2024 geführt.

Zu den wichtigsten Ergebnissen dieser Forschung gehören die praktischen Anwendungen, die sich aus der Integration von KI in die Rechnungslegung ergeben können, wie etwa schnellere Berichtszyklen und besseres Big-Data-Management. Die größten Herausforderungen, denen sich die Buchhaltungsfachleute gegenübersehen könnten, sind die Grenzen der KI, insbesondere ihre Zuverlässigkeit und Effizienz, sowie das Fehlen strukturierter Schulungen und Anleitungen für den Einsatz von KI. Die Forschungsteilnehmer: innen sind sich einig, dass es schwierig sein wird, einen Kompromiss zwischen den etablierten Rollen und der Integration von KI in die Rechnungslegung zu finden. Auch wenn sich die Verantwortlichkeiten von Buchhaltungsfachleuten in Zukunft drastisch verändern könnten, ist nicht zu erwarten, dass ihre Positionen vollständig durch KI-Systeme ersetzt werden.

Zu den Beschränkungen der Forschung gehören die Einschränkungen des Querschnittsanalyse, Kontext- und Umweltfaktoren, einschließlich der vorherrschenden Zurückhaltung gegenüber der Ausweitung der KI und des allgemeinen kulturellen Widerstands gegen Veränderungen in der Buchhaltungsbranche. Die Stichprobengröße sowie die demografischen Einschränkungen werden in dieser Studie ebenfalls als Forschungseinschränkung betrachtet.

Einerseits wird erwartet, dass Buchhaltungsfachleute mit einer Innovation konfrontiert werden, die ihre Effizienz steigern und die Entscheidungsfindung optimieren kann. Andererseits besteht die Gefahr, dass sie mit Veränderungen konfrontiert werden, die nicht nur ihre Aufgaben reduzieren, sondern auch zu einem weitreichenden Personalabbau in der Branche beitragen könnten.

Die Forschung basiert auf Diskussionen in der bestehenden akademischen Literatur und umfasst Bereiche wie Chancen und Gefahren der KI-Integration, die Frage des Kompromisses zwischen etablierten Rollen und technologischem Fortschritt sowie ethische Implikationen und Datenschutzbedenken.

Abstract

Purpose – This thesis attempts highlight potential applications of artificial intelligence in accounting and offer insights from stakeholders who are involved in the future of accounting where human and technological advancements can actively complement each other.

Design and methodology – The research design of this thesis is qualitative and single-cross sectional. The thesis uses semi-structured interviews in order to gain direct insights from the target stakeholder groups. The research participants include accounting and IT professionals and accounting managers, who have already gained experience with AI tools in their work-place. A total of 15 semi-structured interviews were carried out between June and July of 2024.

Findings – The key findings of this research include the practical opportunities that can arise from the integration of AI into accounting, such as faster reporting cycles and better big data management. The main challenges that accounting professionals may face in the future are the limitations of AI, particularly its reliability and efficiency, and the lack of structured training and guidance on the use of AI. There is a clear consensus among the research participants that the compromise between established roles, and the integration of AI into accounting will be difficult to achieve. However, while the responsibilities of accounting professionals may shift dramatically in the future, their positions are not expected to be completely replaced by AI. Monitoring and interpersonal skills will continue to be important in overcoming the ethical implications and practical concerns of AI integration into accounting.

Research limitations– Research limitations include the constraints of the cross-sectional research design and contextual and environmental factors around the research, including the prevailing reluctance towards AI expansion and the overall cultural resistance to changes within the accounting industry. The population and sample size, as well as the demographic constraints, are also considered as one of the research limitations in this research.

Practical implications – On the one hand, accounting professionals are expected to be faced with an innovation that can increase their efficiency and optimize decision-making. On the other hand, there is a risk that they will be faced with changes that will not only cut down on their responsibilities but could also contribute to widespread personnel reductions in the industry.

Originality/value – The research is based on discussions in existing academic literature and includes areas such as opportunities and threats of AI integration, a compromise between established roles and technological advancement and ethical implication and privacy concerns.

Keywords – Artificial Intelligence, Accounting, Financial Reporting, Information Technology

Paper type – Interview Research Paper

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1. Introduction

The accounting industry is seriously impacted by the increase in AI dominance, which offers both new chances as well as difficulties for accounting professionals. The accounting industry transitioned from manual accounting methods to computerized systems at the beginning of the century, which has irrevocably transformed many companies in the sector of financial services (Ghasemi et al., 2011). Accounting today inevitably "goes hand in hand with the trends of digital transformation in the financial industry" (Gąsiorkiewicz and Monkiewicz, 2022), which is beneficial for the industry and employees likewise. The integration of AI is set to further transform the accounting industry as it is known today. AI is "not just a buzzword" (Sahota, 2024) and traditional accounting methods are currently being exposed to radical shifts because of the AI integration (Berikol and Killi, 2020). The necessity for "human judgment" (Christy et al., 2024) in accounting processes is also being questioned as AI tools are used in almost every aspect of accounting (Mohammad et al., 2020).

On the one hand, AI offers accounting professionals different benefits, primarily by increasing efficiency (Afiqah Zamain and Subramanian, 2024) and optimizing decision-making processes. In the future, accounting professionals may instead concentrate on "value-adding work" (Woollacott, 2024), while AI will automate operational and repetitive tasks such as invoice entry and data validation (Woollacott, 2024). This shift in responsibilities may result in better financial performance of companies, more accurate financial reporting, and the capacity to provide more consulting services (Marks, 2024). On the other hand, however, AI might also present possible threats to the industry as a whole. Some of the major issues that accounting professionals may have to deal with in the future are potential "job displacement" (Buchanan, 2005), ethical issues of AI usage (Loisbichler and Lehner, 2021), and the possibility of AI tools being misused for personal advantages (Sahota, 2024). AI is not only influencing day-to-day business, but it could also have an impact on the entire industry, as "AI is not just transforming how tasks are executed, it is also reshaping the skill set required in the accounting profession" (Sahota, 2024).

A recent survey of 121 chief financial officers (CFO) from Gartner (Gartner, 2024) discovered that 58 percent of the surveyed financial organizations are already using AI applications in 2024, which is an increase of 21 percent from a similar survey a year ago (Strickland, 2024). Nevertheless, Gartner acknowledges that AI solutions are not yet targeting the accounting markets to a full extent and that there are not many AI applications in accounting as of today (Marks, 2024). Even if it will be several years before the integration of AI into accounting officially commences, the largest accounting and ERP vendors such as SAP, Oracle and NetSuite are already developing their own unique AI solutions (Marks, 2024). The largest companies in the industry, such as EY and PWC, are already using AI tools for their accounting and auditing services (Marks, 2024). Recent reports also show that young accounting professionals are to some extent expected to have sufficient level of AI skills and to actively use these in their workplace (Woollacott, 2024).

This topic is explored in the period when the use of the AI chatbot "ChatGPT" is rapidly increasing, after the latest version of the OpenAI language model was released in March of 2023 (Zahn, 2024). The increasing use of various AI chatbots has put pressure on many organizations to implement their own versions of ChatGPT, primarily due to issues of data security and confidentiality (Zahn, 2024).

This thesis will attempt to create a clear picture of the "behind the scenes" (Korstjens and Moser, 2017) of the topic of AI role in the accounting profession by gathering insights from three specific target groups, including accounting and IT professionals and accounting managers. The most important issues identified in the existing academic literature on "this topic are the benefits of AI integration" (Hasan, 2021), the dangers of AI integration and the overall transformation of accounting industry (Zemánková, 2019), the ethical and privacy concerns of AI use (Munoko et al., 2020) and the coexisting of AI and accounting profession (Loisbichler and Lehner, 2021). The main beneficiaries of this research are accounting professionals who are currently dealing with the AI integration into accounting. Another directly affected target group are IT professionals, particularly those responsible for the implementation and maintenance of the current AI systems (Lehner and Knoll, 2022). Indirectly affected are accounting managers, whose monitoring of accounting processes is becoming increasingly important in this context.

The thesis considers current contextual factors such as the prevailing reluctance among the accounting professionals to come to terms with AI expansion and cultural resistance to changing old habits within the accounting industry. Environmental factors which are currently prevalent in Austria include the organizational lack of digital transformation strategies, insufficient AI investment and the overall conservative corporate culture in the accounting industry. The motive behind this thesis is not only to fill the gap in the existing academic literature, but also to provide new insights on this very important issue that might reshape the accounting industry as known today.

The general objective of this thesis is to highlight potential applications and offer insights into a future of accounting where human and technological advancements can actively complement each other (Losbichler and Lehner, 2021). The general objective not only summarizes the essence of this research, but it also provides a clear path for the future research directions that would contribute to the understanding of this rapidly growing issue. Considering the general objective, there are several specific objectives identified within the broader topic of the AI role in accounting profession, particularly in terms of opportunities and threats:

(1) To identify the role, relevance and applications of AI tools currently used in the accounting industry

(2) To recognize key opportunities that arise for accounting professionals from using the AI tools and abandoning traditional methods in accounting

(3) To highlight potential challenges that arise for accounting professionals from using the AI tools and abandoning traditional methods in accounting

(4) To gain insights into the future of accounting, particularly with regard to the developments in the labor market and shifting job responsibilities of accounting professionals

(5) To determine the key ethical and privacy concerns that were identified by accounting professionals in regard to the use of AI tools

This thesis explores very specific aspects of the broader topic of AI integration into accounting, including efficiency gains from AI, issues of "job displacement" (Buchanan, 2005), data privacy and ethical concerns (Loisbichler and Lehner, 2021). The subtopic of efficiency gains will attempt to explore practical implications of AI implementation in accounting processes.

The subtopic of job displacement will, conversely, seek to explore beliefs, reflections, and outlooks on the future job market, in order to gain insights from those who might be affected by this issue in the future. Data privacy and ethical concern is a subtopic that has been largely put in a focus by the existing academic literature. Rather than exploring privacy and ethical implications from a theoretical perspective, this thesis will attempt to gain direct insights from those involved in this issue. The narrow and straightforward focus will allow for an in-depth analysis of this rapidly growing issue.

The research design is qualitative and single-cross sectional. The thesis uses semi-structured interviews in order to gain direct insights from the target stakeholder groups. The research participants include accounting and IT professionals and accounting managers, who have already gained experience with AI tools in their workplace. A total of 15 semi-structured interviews were carried out between June and July of 2024 and data analysis was carried out in September and October of 2024. Considering that different geographical regions have different approaches to the integration of AI into accounting, this thesis places emphasis on the current developments in the accounting industry in Austria. Due to limited financial and time resources, the semi-structured interviews were conducted with research participants from Vienna and Vienna metropolitan region only. The semi-structured interviews should provide enough insights to not only discuss the current issues in this field, but also to highlight future developments and practical implications for the accounting industry.

Besides discussing the specific aspects of the broader topic of AI integration into accounting, including efficiency gains from AI, issues of job displacement (Buchanan, 2005), data privacy and ethical concerns (Loisbichler and Lehner, 2021), the findings of this thesis attempt to expand its significance by addressing three additional research questions:

(1) What AI tools are perceived as the most efficiency increasing in the accounting industry?

(2) What is the most effective way to fight data protection issues related to the use of AI?

(3) What can accounting professionals do in order to stay relevant in the rapidly changing job market?

The remainder of this thesis will unfold in the following manner (Moloi and George, 2024): Section 2 includes a thorough literature review, which explores the existing academic literature, and the gaps identified in the academic literature. Section 3 includes a summary of the methodology, including the description of the chosen research design, sample, and sampling strategies, as well as the data collection and data analysis. Section 4 comprises an overview of the findings, specifically targeting each of the research questions, with each subsection dealing with one of the key aspects of this thesis. Section 5 provides a discussion on key findings, with each subsection discussing one of the three stakeholder groups and simultaneously connecting key findings to the proposed research questions. Section 6 provides a conclusion, discusses how limitations of the research methodology may have impacted the findings and explores research implications and future research directions. References and appendices can be found at the bottom of this thesis.

2. Literature Review

2.1. Theoretical Framework and Gaps in Literature

This research was based on the principles of the stakeholder theory, which was developed by academics and practitioners in the late 1970s, but it was eventually formulated by Freeman in 1984 (Freeman et al., 2010). Freeman selected "three interconnected problems" (Freeman, 2010) related to business organizations: "the problem of value creation and commerce" (Freeman, 2010), "the problem of ethics and capitalism" (Freeman, 2010), and "the problem of managerial mindset" (Freeman, 1984). According to Freeman (2010), businesses "can be viewed as a set of relationships between groups that have an interest in the activities that make up the firm" (Freeman, 2010). While this theory can be applied to explain relationships between different stakeholders within an organization in general, it can also be applied to the topic of AI integration into accounting. As described by Freeman, accounting is a "tool used to construct reality and ultimately assess the risks associated with linking their holdings" (Freeman, 2010). This idea has never been more relevant as it is now with the integration of machine learning algorithms into accounting.

An important notion of the stakeholder theory is the reporting to stakeholders (Freeman, 2010), which is seriously affected by the integration of AI into financial reporting. Financial reporting would significantly benefit from the adoption of AI, including improvements in monthly and quarterly financial reports, internal performance, and management reports (Jedrzejka, 2019). Possible shifts in financial reporting are actively reshaping organizational structures, including relationships between internal stakeholders such as accounting managers and investors, but also relationships with external stakeholders like creditors and suppliers.

The issue of reporting is closely connected to the issue of accountability, which seems to be less visible in accounting, especially in the context of increasing AI inspired decision making (Lehner et al., 2022). Lehner et al. (2022) emphasize the idea of "moral consciousness" (Lehner et al., 2022) in accounting and acknowledge that responsibility is subsequently transferred from accounting professionals to stakeholders in the following stages of accounting processes, including IT professionals and accounting managers (Lehner et al., 2022). Freeman observed this issue and discussed the evident lack of interest in greater accountability to a wider range of stakeholders (Freeman, 2010). Nevertheless, research into accounting topics must inevitably consider different societal perspectives on ethical implications of "AI-based accounting" (Lehner and Knoll, 2022) decisions in the future (Losbichler and Lehner, 2021). This is also discussed by Freeman, who emphasizes that while "effective management of stakeholder relationships helps companies survive and thrive in capitalist systems, it is also a moral endeavor because it involves issues of values, choices, and potential harms and benefits to large numbers of groups and individuals" (Freeman, 2010).

The existing academic literature seems to have overlooked the importance of the stakeholder theory (Freeman, 2010) with regard to AI integration into accounting. The existing academic literature has primarily addressed the direct impact of AI technologies on accounting professionals and neglected the relationship with other relevant stakeholders. In order to fill this gap, this thesis focuses on actors upstream and downstream of this process as well, for instance IT professionals, who are developers of AI solutions and accounting managers, who are responsible for monitoring employee actions in the face of the increasing use of AI tools.

The issue of accountability is further closely connected to the principal-agent theory, which has been widely used to analyze public and organizational accountability issues (Gailmard, 2012). In principal agent theory, one actor or a set of actors acts on behalf of another actor, the so-called principal leader, who may or may not provide incentives for actors to adopt the actions desired by the principal (Gailmard, 2012). As Lehner et al. (2022) note, the issue of "ethical considerations in the workplace is what has been called the accountability gap, i.e., the extent to which the introduction of technology leads to an abdication of ethical responsibility for the consequences of decisions made by real people, in this case accountants and taxpayers" (Lehner et al. 2022). The growing issue of accountability has evident implications for the moral hazard dimension of the principal agent theory (Gailmard, 2012).

Given the rapid AI integration into accounting, accounting professionals can use their informational advantage with AI tools to achieve results that they would not be able to achieve without them (Braun and Guston, 2003). To maximize their productivity, accounting professionals may not stick to good accounting practices and instead violate the moral principles they are supposed to follow, a practice known as "actor opportunism" (Braun and Guston, 2003). Actors such as accounting professionals may conceal their lack of skills and knowledge in order to reduce their workload and still receive recognition for their actions (Braun and Guston, 2003). As it is difficult for principals to constantly monitor the decisions of their agents, particularly with the increasing dominance of AI technologies (Kuzmenko et al., 2023) and the decreasing need for accountant accountability (Braun and Guston, 2003), this gap is only likely to widen in the future. The pace of change in the accounting industry (Strauss and Quinn, 2022) will only increase the need for monitoring and collective awareness of the potential privacy risks related to the use of AI tools.

Although previous studies on "the integration of AI in accounting" (Tandiono, 2023) date back more than 25 years (Baldwin, 2006), these studies have mainly focused on possible future implications of AI and have not explored relationship between the principal and agents in this issue. i.e., accounting professionals and accounting managers. As discussed by Banta et al. (2022), "existing research has mainly focused on the AI technologies used in and by multinational companies, mostly neglecting the human component and its impact" (Banta et al., 2022). Researchers have mostly discussed the potential issues of AI integration such as personnel reductions, ethical issues of using AI, cost reduction and optimization of financial performance (Sahota, 2024). Nevertheless, academic literature seems to have overlooked the current challenges that organizations are facing, particularly in relation to the implementation of AI tools, the lack of AI experts for the ongoing development and maintenance of AI tools, and the general cultural resistance of accounting professionals to this growing issue.

A big portion of the existing academic literature has addressed the topic either through a content analysis (Jedrzejka, 2019) or a thematic literature review (Hasan, 2021). A minority of papers discuss the topic using the interview research method. Those that did explore this method gathered insights from a single stakeholder group, such as accounting professionals (Banta et al., 2022) or managers, e.g., accounting managers (Kokina and Blanchette, 2019) instead of comparing different stakeholder groups. The existing academic literature also seem to have neglected IT professionals, who are responsible for developing and implementing AI-supported systems in accounting processes. For this reason, this thesis utilizes semi-structured interviews in order to draw comparisons between different stakeholder groups, which include accounting and IT professionals and accounting managers. The idea of this approach was to shift the perspective away from the prevalent perspective in existing academic literature where future advances in AI can affect accounting professionals only.

2.2. AI: History and Definition

The “development of artificial intelligence can be divided into two periods” (Hasan, 2021) – first and foremost the ancient history, where the first ideas of intelligent machines can be found, and modern history, which began with “modern computers in the post-World War II period” (Hasan, 2021). Buchanan (2005) mentions that the chronology of artificial intelligence is characterized by “fantasies, possibilities, demonstrations and promises” (Hasan, 2021). The first concept of intelligent machines can be found in Greek mythology and the stories of Hephaestus, a blacksmith who was able to spontaneously create mechanical robots (Greenman, 2017 in Hasan, 2021). Aristotle created the “first formal deductive reasoning system” (Greenman, 2017 in Hasan, 2021) in the 4th century BC. In 1206 AD, Arab mathematician Ismail Al-Jazari is believed to have invented “the first programmable humanoid robot” (Greenman, 2017). In addition, “in 1642, French mathematician Blaise Pascal invented the first calculating machine” (Greenman, 2017 in Hasan, 2021). The first computer game was invented in 1914 and was also known as the “first chess calculator” (Mohammad et al., 2020).

An important milestone in the history of artificial intelligence was Turing's seminar paper on computing machines and intelligence in 1950 (Zemankova, 2019), which explored the idea of creating an intelligent electronic computer (Buchanan, 2005). This was the starting point for “the imitation game known as the Turing Test” (Buchanan, 2005). Turing developed this test to see if computers could “mimic human behavior” (Ahmad, 2024). Thanks to this extensive research, “Turing test has become the standard for assessing artificial intelligence” (Ahmad, 2024).

The term AI was brought in 1956 by mathematician John McCarthy at the Dartmouth Conference on Artificial Intelligence (Buchanan, 2005). The prominent “Dartmouth Conference on Artificial Intelligence” (Piel and Seising, 2023), held at the Ivy League Member Dartmouth College initiated a science project on the future of artificial intelligence, which inspired other researchers and highlighted the growing importance of artificial intelligence (Mohammad et al., 2020). Scientists and artificial intelligence “researchers John McCarthy, Marvin Minsky, Claude Shannon and Nathaniel Rochester” (Mohammad et al., 2020) initiated this project “based on the premise that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it” (Zemankova, 2019). The main goal of the Darthmouth Conference on Artificial Intelligence “was to find out how to make machine use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves” (Mohammad et al., 2020).

Intelligent machines have been at the center of AI research since the mid-1950s, when computer scientists began developing programs that previously were thought to need support of human intelligence (Martinez, 2018). The “term machine learning was introduced by the computer scientist Arthur Samuel” (Ucoglu, 2020) in 1959. He coined “it as a field of study that gives computers the ability to learn without being explicitly programmed” (Ucoglu, 2020). The first mass-produced industrial robot began working at General Motors in 1961 (Greenman, 2017). A major turning point in artificial intelligence research was the introduction “of knowledge-based systems in the 1960s and early 1970s” (Buchanan, 2005). The 1960s also saw the emergence of the first organizations supporting the development of artificial intelligence enterprises, including two academic laboratories at “the Massachusetts Institute of Technology (MIT) and Carnegie Mellon University (CMU)” (Buchanan, 2005). The annual International Conference on Artificial Intelligence began in 1969 and became so im-

portant that the “American Association for Artificial Intelligence was founded in 1980” (Ventre, 2020). Extensive research conducted in the 1980s also continued in the 1990s but was shortly neglected for a decade due to the overwhelmingly negative feedback on AI developments (Afiqah Zamain and Subramanian, 2024). Research was relaunched at the beginning of the century to explore “how human brains could be used to redesign machines” (Afiqah Zamain and Subramanian, 2024). In 2001, computer scientist Cynthia Breazeal invented the first modern robot, “Kismet”, which was able to analyze social relationships and expressions and effortlessly interact with humans (Mohammad et al., 2020). IBM's Watson, which was released in 2011, was one of the greatest achievements in the field of AI (Mohammed et al., 2020).

The most recent addition to the AI field is one of the most widely used AI inventions, the AI chatbot ChatGPT. This chatbot is based on large language models (LLMs) and it was created by the American AI research organization OpenAI (Marr, 2023). The first model, GPT-1, was presented in June 2018 and it “demonstrated power of unsupervised learning in language understanding tasks” (Marr, 2023). The next-generation model, GPT-2, which was released in February 2019, was already capable of producing coherent multi-paragraph texts (Marr, 2023). The GPT-3 that was launched in June 2020 was a major invention because it could be used for various functions, including writing e-mails and “generating programming codes” (Marr, 2023). The latest invention, the GPT-4, brought changes such as reduced possibility of generating offensive or dangerous results as well as the greater accuracy in facial recognition (Marr, 2023).

In terms of definitional analysis of AI, Grewal perfectly summarizes the chronological development of the various AI perspectives through history (Grewal, 2014). The earliest definitions of AI start from the mechanical level, such as that of McCarthy, who defines it as “the science and technology of making intelligent machines” (Luthfiani, 2024). The next level is “intelligent agents”, with earlier AI textbooks defining the field as “the study and development of intelligent agents” (Grewal, 2014). The later definitions already consider AI at the non-mechanical level, defining it as “simply the application of artificial or non-naturally occurring systems that use the knowledge layer to accomplish goals” (Grewal, 2014). The trend moved towards defining AI as “ideas in machines” (Grewal, 2014), when AI was defined as “the study of ideas to bring machines into existence that respond to stimuli consistent with traditional human responses, given the human capacity for reasoning, judgment, and intention” (Grewal, 2014). The next stage was defining AI in terms of simulation, placing the emphasis on its ability of mimicking human behavior (Grewal, 2014). Artificial intelligence was soon considered a branch of computer science and defined as “systems that exhibit some form of intelligence, systems that learn new concepts and preferences, systems that can reason and make useful inferences about the world around us” (Grewal, 2014). Eventually, artificial intelligence began to be discussed in the context of computer programming and computation, as it was defined as “the concept that computers can be programmed to acquire capabilities such as learning, reasoning, adaptation, and self-adaptation” (Grewal, 2014).

Russell and Norvig (2010) argued that all definitions of “artificial intelligence can be divided into four categories: acting humanely, thinking humanely, thinking rationally and acting rationally” (Martinez, 2018). Martinez (2018) also suggested that the general definition of AI that encompasses a division into four categories, proposed by Russel and Norvig (2010), can be applied to different aspects of artificial intelligence, as long as it is flexible and encompasses future developments in artificial intelligence (Hasan, 2021).

Zhang et al. (2020), on the other hand, define artificial intelligence differently (Alnoor et al., 2024), arguing "that AI is the result of successful uses of big data and machine learning (ML) technology to comprehend the past and forecast the future using massive amounts of data" (Hasan, 2021). Grewal (2014) argues that artificial intelligence is "the mechanical simulation system of gaining knowledge and information that also processes intelligence of the universe" (Hasan, 2021). The perspective that artificial intelligence is a device capable of performing tasks that could normally be performed by a human (Hasan, 2021) has also found its place in the existing academic literature (Chukwudi et al., 2018).

2.3. Digital Transformation of Accounting

As an integral part of the social and business environment, the pace of digital transformation processes is also "having a significant impact on accounting" (Strauss and Quinn, 2022). Digital transformation is a driving force that is forcing a rethinking of the nature of accounting information systems (AIS) (Strauss and Quinn, 2022), particularly in terms of their ability to efficiently manage data and information in order to optimize the processes of decision makers in accounting functions (Aguiar and Gouveia, 2020). With the integration of information technologies in the financial industry (Berikol and Kili, 2021), accounting practices in both the public and private industries shifted from analogue recording of financial transactions to a completely electronic environment (Berikol and Killi, 2020).

Although financial transactions "are expressed in monetary terms and have been physical" (Berikol and Killi, 2020) since its origins, most companies have switched to digital accounting systems in the last decades (Berikol and Killi, 2020). For instance, while at the beginning of the century no more than a quarter of all information stored worldwide was digital (Mayer-Schönberger and Cukier, 2017), by 2021 digitally stored information accounted for more than 98 percent of all stored information worldwide (Warren et al., 2015). For this purpose, large accounting application softwares have been recently developed and are now widely used, and accounting professionals at entry-level positions are expected to already be familiar with these softwares (Berikol and Killi, 2020).

The first attempts at optimizing accounting processes can be followed back to the 1950s (Sipola et al., 2024) and the introduction of punched cards, which were used to store and retrieve data on financial transactions (Jedrzejka, 2019). The development of electronic computers and their use in accounting enabled automatic comparisons, resulting in significant time and cost savings (Jedrzejka, 2019). Accounting departments were among the first in social and business environments to actively collaborate with IT departments (Damasiotis et al., 2015) and were the key drivers of the "computerization of offices" (Jedrzejka, 2019). For instance, simple bookkeeping and processing of financial transactions, which used to be done manually, were the first tasks to be fully computerized (Jedrzejka, 2019). The downside of computerization and increasing automation was the use of multiple applications, which required "a lot of effort and time to program the necessary data" (Jedrzejka, 2019). The 1980s saw a significant change with the introduction "of sophisticated expert systems and artificial intelligence" (Jedrzejka, 2019), although these were limited to large organizations due to costly implementation (Jedrzejka, 2019).

The most significant change was "the introduction of enterprise resource planning (ERP) systems, which enabled cross-functional integration, centralized control over the system and higher automation, which facilitated further efficiency improvements" (Jedrzejka, 2019). An important feature of ERP systems was that, for the first time in accounting history, they al-

lowed financial “transactions to be traced back to the employee” (Jedrzejka, 2019) who initially performed them (G. Sutton, 2006). Similar to earlier computerization efforts, ERPs still involved great complexity because multiple applications had to be used in order to provide solutions (Hyvönen et al., 2008). Over the last couple of years, large ERP systems, including SAP and Oracle, have been widely used in large organizations for accounting processes, mainly for asset accounting and financial reporting (Berikol and Killi, 2020). In addition, many companies have introduced “various management accounting tools such as activity-based costing, balanced scorecards and strategic corporate governance” (Berikol and Killi, 2020).

Prior to the introduction of robotic process automation (RPA), it was not possible to achieve higher levels of automation in accounting processes (Gotthardt et al., 2020). RPA can be informally “defined as the automation of processes mimicking human interaction using technology to reduce manual intervention and low value human touches in an auditable and controlled manner” (Kokina and Blanchette, 2017). RPA itself is a “software running other application software and can be used to automate predefined business processes” (Zemankova, 2019). RPA systems are powered by software bots that act as “digital workers” (Kokina and Blanchette, 2019) and have their own computer nodes, usernames and passwords (Kokina and Blanchette, 2019). The main reason for the introduction of RPA systems in accounting was to remove repetitive and operational tasks (Kokina and Blanchette, 2019), including “file organization, integration of data from various files, and basic testing in Excel, from daily operations” (Zemankova, 2019). RPA automates agile accounting processes by using existing digital technology and human judgment (Ahmad, 2024) and enables the duplication, transfer, and connection of data between software applications (Ahmad, 2024). Since many accounting tasks involve processing transactions at a high level, where there is no need for frequent updates and human judgment, the potential of RPA technologies in this area is very high (Kokina and Blanchette, 2019).

In the future, the impact of technological advances could lead to up to 40 percent of accounting tasks being replaced by automation tools, with payroll and simple bookkeeping being the most affected activities (Berikol and Killi, 2020). The job description of an average accounting professional looks significantly different compared to 20 years ago and it will look very different 20 years from now (Greenman, 2017). In addition, new accounting graduates should concentrate on developing skills in consulting, business analysis and advisory services (Greenman, 2017).

2.4. Integration of AI in Accounting

Research on the history of AI integration into accounting can be traced back more than 25 years in the past (Baldwin, 2006). Various forms of AI in accounting have also been in use for more than two decades (Greenman, 2017). The first introduction of AI in accounting processes allowed accountants to have complex tasks performed by the software, resulting in a significant improvement in work efficiency (Afiqah Zamain and Subramanian, 2024). This is largely due to the fact that with a rapid increase in data volume, current technological developments have not been able to analyze a significant volume of data at sufficient speed (Banta et al., 2022). In some situations, as Kokina and Davenport (2017) argue, a human approach to analytics is not possible anymore due to “the large volume of data” (Kokina and Davenport, 2017). Additionally, when robotic systems take over tasks such as data collection and entry (Moloi and George, 2024), there are significant time savings and the error rate is reduced

(Jedrzejka, 2019). There is reason to believe that the impact of AI will be even greater in the future due to recent developments in information technologies (Kokina and Davenport, 2017).

AI in accounting refers to the application of advanced computing technologies to perform the traditional tasks of accounting professionals and encompasses various "technologies such as natural language processing (NLP), robotic process automation (RPA) and predictive analytics" (Nitschke, 2024). Modern AI tools can search "for keywords and patterns in complex electronic documents and extract relevant accounting information from different sources, such as sales contracts and bank statements" (Agnew, 2016). They are also able to detect anomalies in data, such as unexpected increases in orders, unusually large expenditures for a creditor, or particularly favorable leasing terms for a supplier (Brennan et al., 2017). Machine learning algorithms can also match invoices with the related purchase order, determine the cost center and place them in a payment pool where humans can then review and submit the payment request (Ucoglu, 2020).

Kokina and Davenport (2017) have identified different categories of tasks that AI is already performing or will perform in accounting in the future (Kokina and Davenport, 2017). The dominant task in the integration of AI in accounting, which is already being used by many companies, is certainly "simple number analysis" (Kokina and Davenport (2017), which is categorized as "automation of repetitive tasks" (Kokina and Davenport, 2017). The next task category is machine learning, which is slowly being adopted by large accounting firms for data analysis but is especially relevant for companies that want to significantly increase speed and productivity of their models (Kokina and Davenport, 2017). It is mainly used to detect anomalies in large data sets (Kokina and Davenport, 2017). The next step is natural processing, which has been adopted by some accounting and law firms (Kokina and Davenport, 2017). Although this technology is not primarily used in accounting, it has the potential to be used in order to automate various audit reporting (Kokina and Davenport, 2017). Finally, the category of "perform digital tasks" (Kokina and Davenport, 2017) encompasses all tasks, including accessing data and modifying entries and records, which are clearly linked to accounting and auditing processes (Kokina and Davenport, 2017). In the future, these technologies may also come together to achieve better performance management (Kokina and Davenport, 2017).

There are a number of functions where integration of AI can significantly help accounting processes (Jedrzejka, 2019). Some of these include period-end closing, including closing general ledgers and subledgers, approving journal entries, and consolidation (Jedrzejka, 2019). Reporting would benefit even more from the adoption of AI, due to the reason that AI can improve processes such as monthly and quarterly financial reports, internal performance, and management reports, including aggregation and analysis of financial and operational data (Jedrzejka, 2019). Another function significantly improved by AI integration would be the maintaining of account receivables and account payables, including functions such as "maintaining and updating customer and supplier data, processing, and uploading invoices, automating approvals, authorizing payments and matching invoices to sales and purchase orders" (Jedrzejka, 2019). Finally, AI could optimize functions such as cash management, "general ledger and subledger accounting, expense claims, expense reports, payroll and tax accounting" (Jedrzejka, 2019) (Jedrzejka, 2019).

Another important AI technology that can be used in accounting is expert systems (ES) (Hasan, 2021). In financial accounting, they can be used for automatic identification systems (AIS) and financial reporting, invoice processing and worksheet development (Hasan, 2021).

In management accounting, they can be used “in inventory control, cost analysis, diagnosis of management control systems and investment decisions” (Said Abdelazim Ahmed et al., 2022).

The integration of “artificial intelligence in accounting and auditing” (Luthfiani, 2024) is fundamentally changing the profession and its impact can only increase in the future due to an increase in AI investments (Afiqah Zamain and Subramanian, 2024). Artificial intelligence essentially seeks to create a system where computers can work autonomously, while accounting professionals “use their time instead to analyze the accuracy of financial statements and eventually become financial advisors to companies” (Afiqah Zamain and Subramanian, 2024).

Some researchers are convinced that fields like financial services are most likely to be supported, if not completely dominated, by robots in the future (Jedrzejka, 2019). This is due to the reason that recording of accounting transactions requires a high degree of accuracy and consistency, as well as the manual processing of repetitive transactions (Jedrzejka, 2019), which robots can not only provide, but also surpass in efficiency when compared to human accounting (Jedrzejka, 2019). As computers are already capable of recognizing images and handwritings and, most importantly, learn from experience, in the future “robots will not only be able to mimic human actions, but also improve their performance and accuracy” (Jedrzejka, 2019). Other studies, however, expect accounting to be one of the areas that technological advances will improve in the upcoming decades, but which will not result in a full automation of processes (Davenport and Kirby, 2016). Constant development of artificial intelligence will make people trust it, because without human judgment, artificial intelligence tools will not be able to develop a system that simplifies accounting and auditing processes (Afiqah Zamain and Subramanian, 2024).

2.5. Opportunities and Challenges

Many studies have highlighted the benefits of integrating AI into accounting processes, which include greater efficiency and effectiveness, improved consistency, and better decision-making and communication (Hasan, 2021). Mohammad et al. (2020) suggest that constant technological advancements in artificial intelligence in accounting can enable accounting professionals and firms to reduce accounting costs. In addition, they can improve the value proposition of the “accounting industry by shifting the focus from routine tasks to data-driven and analytical decisions” (Hasan et al., 2021). Hybrid professionals “are expected to develop and lead the profession in the near future” (Hasan, 2021). Machine learning in accounting is also driving a cultural resistance movement in the accounting industry and changing the relationship between accounting and technology (Jedrzejka, 2019). Machines are no longer only tools, but they can also replace human roles and tasks (Jedrzejka, 2019).

Machine learning algorithms can enable sophisticated scenario analysis, process complex scenarios, assess the potential impact of different financial outcomes and facilitate strategic financial management (Adeyelu et al., 2024). Accounting can also use scenarios processed by AI to assess the impact of strategic decisions (Adeyelu at al., 2024). Bizarro and Dorian (2017) highlight that accounting processes “at the metadata level, such as source documentation, paperwork, conference calls, emails” (Hasan, 2021) and structuring of internal and external sources, can also be managed by AI in the future (Hasan, 2021).

Bizarro and Dorian (2017) emphasized that despite the potential increase in efficiency that AI technology offers in accounting tasks, it cannot replace human skills such as logical reasoning, expressiveness, skepticism and professional judgement (Hasan, 2021). Although accounting systems still require human involvement, AI can significantly reduce the risk of financial fraud (Bako and Tanko, 2022). This is all more relevant as digital tracking can be monitored, and detection of financial fraud can be supported by using artificial intelligence (Jedrzejka, 2019). Regardless of human errors in manual data entry, the software system automatically indicates "the error as inaccurate data entry, which can be corrected to improve the accuracy of accounting data" (Jedrzejka, 2019). In addition to the financial risk that inaccurate data can cause, it can also seriously damage the reputation of an organization (Banta et al., 2022). For this reason, accounting professionals should use AI solutions to significantly reduce the possibility of errors in data entry (Banta et al., 2022).

AI solutions can perform multiple tasks simultaneously, while accountants can "focus on higher value-added activities such as optimizing decision-making" (Varma and Singh, 2024) and strategic analysis (Banta et al., 2022). For instance, optical character recognition (OCR) solutions can be used to automatically enter data into the system, saving significant time and resources (Banta et al., 2022). In addition to the ability to store data in an accounting database (Rivera, 2021), AI tools have "techniques that help decision makers increase their understanding of the transactions recorded by accounting systems" (Afiqah Zamain and Subramanian, 2024). The efficiency gains in AI-supported transactions can contribute to faster financial reporting and optimized decision making (Adeyelu et al., 2024).

As financial organizations are vulnerable to criminal elements, AI can also be used to fight money laundering and identity and data theft (Alhajeri and Alhashem, 2023). AI tools can effectively "monitor customers, markets and financial transactions as it is easier for engineers to train computers to mimic human behavior" (Alhajeri and Alhashem, 2023) in order to spot different patterns in banking behavior. Unfortunately, since AI can learn certain habits and profiles of bank customers, it can also be taught to steal their data, which can later be used for money laundering (Alhajeri and Alhashem, 2023). This idea can act as the starting point for a discussion on the issues of using AI in accounting (Pastva et al., 2024).

Omoteso (2012) has highlighted some of the challenges of integrating AI into accounting, including lengthy decision-making processes (Alnor et al., 2024) "due to the consideration of multiple alternatives" (Said Abdelazim Ahmed et al., 2022), the high cost of integrating AI systems into accounting, and the delay in upgrading and maintaining systems (Omoteso, 2012). AI tools also produce barriers to knowledge acquisition for entry-level accounting professionals (Omoteso, 2012). Other challenges include limitations in developing skills or making professional human judgments, the risk that AI tools will be shared with competitors, and the possibility that advanced AI tools will be used in court against accounting professionals because of their overreliance on evidence of AI assistant decisions (Omoteso, 2012).

In addition to this problem, according to Luo et al. (2018), some of the challenges in integrating AI into accounting include the lack of initial experience, slow return on costly investments (Luthfiani, 2024) and the lack of knowledge and know-how among accounting professionals (Luo et al., 2018). Many researchers have pointed out that the main issue with integrating AI into accounting is the high upfront "cost of implementing such systems, but in the long run, this decision usually leads to a reduction in total operating cost" (Mohammad et al., 2020). Mohammad et al. (2020) also emphasize that the main problems of the AI integration into accounting are the lack of an effective strategic policy for AI, the lack of employee moti-

vation and the lack of commitment of accounting managers to AI solutions (Mohammad et al., 2020).

The benefits of AI integration into accounting should not distract from important issues caused by AI developments, such as the threat to the security of accounting data, which can compromise "the vital characteristics of data due to misuse of technology, incompatible IT systems, improper manipulation of stored or transmitted data, or improper application of AI solutions" (Banta et al., 2022). Another important issue is the "weakness of internal controls, which can affect the reliability of accounting data" (Banta et al., 2022). To overcome this issue, accounting professionals need to "work together with internal control and IT departments to identify and avoid risks related to internal control systems" (Banta et al., 2022) and, where possible, implement new controls to avoid residual risks (Banta et al., 2022).

Another important "challenge that can affect the reliability of accounting data is the subjectivity of the algorithms used in accounting processes" (Banta et al., 2022). Even if AI is capable of performing rational actions, the same cannot be stated for the machine learning algorithms behind the AI-supported solutions (Banta et al., 2022). These algorithms are based on human logic, which can lead to undesired bias in their behavior (Banta et al., 2022).

Although AI systems cannot have self-interest, they can learn about human biases through the data presented to the system (Loisbichler and Lehner, 2021). In addition to human judgement that AI systems lack, one of the main strengths of the human brain is that it constantly solves problems that exceed the boundaries of AI technologies (Loisbichler and Lehner, 2021). The human brain is not static, it is constantly being restructured and therefore problems are spontaneously observed from many different perspectives (Loisbichler and Lehner, 2021). The main distinction between the human brain and artificial intelligence is the fact that human brain is able to think innovatively and to direct thoughts differently, while artificial intelligence is able to analyze raw data "depending on the goal and to jointly provide an early interpretation of the results" (Loisbichler and Lehner, 2021).

Another major obstacle to the use of AI is the so-called "artificial stupidity" (Afiqah Zamain and Subramanian, 2024). This include errors that are learned from low-quality information that is introduced into the system, or which also incur due to the system not being able to cover all possible scenarios, leading to errors occurring when tests are performed with real-world scenarios (Afiqah Zamain and Subramanian, 2024). Accounting professionals should not rely solely on technology for their in-depth analyses, as almost all "AI-based solutions have a residual risk that cannot be completely avoided" (Banta et al., 2022).

Zemánková (2019) emphasizes that the extensive use of AI in accounting could lead to a potential increase in income inequality, lower demand for labor force, lower financial security, and similar consequences for accounting professionals (Zemankova, 2019). Kokina and Davenport (2017) point out that, according to a report by Ernst & Young, the adoption of AI could potentially halve the annual inflow of new employees and significantly change the employment situation in the accounting industry (Agnew, 2016 in Kokina and Davenport, 2017). However, top managers of large organizations agree that human accountants will still be needed in the future (Agnew, 2016), but "the skills required to be a successful accountant are likely to significantly change" (Kokina and Davenport, 2017). As Huang and Rust (2018) notice, another barrier to the use of AI "is the frequent changes in laws and regulations, which would require AI tools to be regularly updated" (Hasan, 2021). This is particularly "the case for changes in tax laws" (Hasan, 2021).

Luan et al. (2020) also discuss the challenges of AI technologies in research, policy, and industry in the field of accounting and auditing (Hasan, 2021). They argue that in response to the rapid development of artificial intelligence and the innovations brought by the big data revolution, educators, policy makers and practitioners need to work together to fully unlock and promote the potential of AI technologies (Hasan, 2021).

Educators also need to teach students and future accounting professionals about the important issues "such as big data, blockchain technology and artificial intelligence" (Hussein et al., 2024). Regulators also need to promote change in the form of developing and implementing new strategies and redesigning professional development and training processes (Hasan, 2021). Educators should not only focus on teaching traditional "accounting information systems, but also on topics such as data analysis, information, and technology management" (Hasan, 2021). AI technology concepts should be fully integrated into business education in order to introduce future accounting professionals and researchers to the new world where AI and accounting could eventually coexist (Hasan, 2021).

In the future, accounting tasks will in all probability include some of the "following duties, such as working with accounting machines to monitor and improve their performance" (Kokina and Davenport, 2017). They are also likely to include monitoring "the use of smart machines in external and internal audit processes" (Kokina and Davenport, 2017). and assessing the level of necessary deployment of intelligent machines (Kokina and Davenport, 2017). Accounting tasks are also likely to include partnership between accounting firms and ERP vendors in projects such as developing new AI tools and updating and maintaining the ones in use (Kokina and Davenport, 2017). Accounting tasks will likely include those tasks currently considered impossible without the support of AI tools, "including servicing internal and external clients and interpreting audit and financial results for senior executives and boards" (Kokina and Davenport, 2017). Accounting functions must also constantly assess whether there is a need to replace old AI tools and implement new AI tools and discuss any accounting processes that would be uneconomical to automate by building new AI systems (Kokina and Davenport, 2017). As most of the remainder will call for knowledge of the business of clients and the possibility to interact with them, tasks performed by experienced accounting professionals will remain, but the responsibilities of entry-level accountants will likely be automated (Kokina and Davenport, 2017).

2.6. Ethical and Privacy Concerns

The "ethical implications of AI tools were not obvious in the early 1980s" (Munoko et al., 2020), but in the 1990s researchers began to observe a lack of cognitive ability and bias of these tools (Munoko et al., 2020). Given the outbreak of artificial intelligence and its recent integration into accounting, not sufficient attention has been paid to ethical implications of this issue in accounting research (Munoko et al., 2020). For accounting professionals, the problem of interpreting the results generated by artificial intelligence systems is not only linked to concerns about the integrity of the system's decisions, but also to a broader perception of the absence of universal principles and ideals (Loisbichler and Lehner, 2021).

However, as companies and accounting and auditing professionals increasingly rely on AI, they are instructed to assume that AI tools are always accurate, that they always behave within defined boundaries, and that fluctuations in this behavior are always observable and correctable (Munoko et al., 2020). Failure to meet these assumptions needs to have ethical, legal,

and economic consequences (Munoko et al., 2020). Being a subdiscipline of practical philosophy dealing with normative issues, accounting ethics seeks to answer the fundamental question of what appropriate behavior in business environments actually is (Ahmad, 2024). Nevertheless, representational theory can interact well "with philosophical and sociological approaches" (Lehner and Knoll, 2022) to the integration of AI in accounting to provide a good foundation "for the role of ethics in AI-based accounting" (Losbichler and Lehner, 2021).

Unlike traditional organizational contexts, where human performance is "well-connected to accountability, this accountability seems to be less visible in the context of AI-based decision making" (Lehner et al., 2022). Lehner and Knoll (2022) also discuss "the ability of AI to solve complex decision-making problems" (Lehner and Knoll, 2022) at a speed that is not human (Lehner and Knoll, 2022. This behavior can lead to a lack of transparency, which can further evolve to mistrust in these technologies (Munoko et al., 2020). The integration of machine learning models (Sadati et al., 2024) into financial reporting can be used to detect and prevent financial fraud (Ahmad, 2024). Modern artificial intelligence systems can act autonomously and use available data to make interpretations and predictions (Ahmad, 2024). This can have serious practical implications as it goes against traditional accounting methods that completely rely on human judgment (Munoko et al., 2020).

Sensitive information that is entrusted to accounting professionals, such as income, expenses, debts, and investments, must be protected at all costs in order to avoid consequences such as identity theft, financial fraud or reputational damage (Schweitzer, 2024). Nevertheless, accounting professionals are responsible for ethics of their actions, and "they must be aware of the ethical implications of AI" (Strauss and Quinn, 2022) and have the knowledge to use AI tools responsibly (Celik, 2023). Auditors must carefully evaluate the data collected, the storage and security measures, and the potential risks "of data breaches or unauthorized access" (Schweitzer, 2024). West (2017) defines this need for assessment as a broader concept, arguing that "data capitalism is a system in which the commodification of our data enables an asymmetric redistribution of power, weighted in favor of those actors who have access to the information and are able to make sense of it" (Lehner et al, 2022). West (2017) also points out that the complexity of interactions between actors is a major source of ethical dilemmas and is caused by the installation of the so-called AI coworkers (Lehner et al., 2022).

Accounting professionals are not the only group that should be held accountable for dealing with inherently sensitive information and using artificial intelligence tools (Schweitzer, 2024). Developers, as architects of machine learning algorithms, also have a major responsibility in this case (Schweitzer, 2024). Moral awareness needs to be applied by all employees, and it is important to ensure that algorithm developers and data providers are also held accountable (Lehner et al., 2022). Not only do they need to ensure ethical implementation of these systems (Schweitzer, 2024), but "ethical AI-based decision-making processes need to start at the algorithm development phases" (Lehner et al., 2022). Lehner et al. (2022) also discuss the fact that if the first segment of moral awareness is not introduced, all other processes may fail to ensure ethical use of AI systems in practice (Lehner et al., 2022). Moral awareness of developers in the design phase is a precondition for later accountability of all stakeholders in subsequent phases (Lehner et al., 2022). This implies that users also need to consider the purpose of AI tools and ensure that their actions do not harm other users (Schweitzer, 2024). This includes carefully monitoring biases, immediately resolving problems and constantly updating existing systems (Schweitzer, 2024). In addition, regulators need to introduce and enforce regulatory measures that can "govern the development, deployment and end use of AI tools" (Sipola et al., 2024).

There is a need for business stakeholders to be fully transparent about their intentions and strategic use of AI tools (Ahmad, 2024). From an organizational perspective, Albu and Flyverbom (2016) in Lehner et al. (2022) also emphasize that "transparency is mostly related to the information sharing and the perceived quality of the information shared. However, such a narrow focus on information and quality overlooks the dynamics of organizational transparency" (Lehner et al., 2022). Some "authors believe that the approach of openness is an important factor that promotes trust in AI tools" (Naik et al., 2022 in Ahmad, 2024). On the one hand, such an approach enables users to obtain the information they need and encourages them to make informed decisions about the current use of AI tools (Ahmad, 2024). On the other hand, users need to be aware of the concept of responsibility when using AI technology (Ahmad, 2024). As Gunz and Thorne (2020) in Lehner et al. (2022) argue, "of particular concern to those concerned with ethical considerations in the workplace is what has come to be called the accountability gap, i.e., the extent to which, or the possibility that, the adoption of technology will lead to an abdication of ethical responsibility for the consequences of decisions by real people, and in this case accountants and taxpayers" (Lehner et al.2022).

Excessive transparency and availability of information can also significantly affect the human-machine interaction (Lehner et al., 2022). If all decision-making processes are made transparent by machine learning algorithms, humans may start to abuse the algorithms based on their perception of the means (Lehner and Knoll, 2022). Similarly, humans may influence the data fed into algorithms to achieve their desired outcomes (Lehner et al., 2022). Transparency can therefore have serious consequences for the ethical implications of integrating AI into accounting and can be seen as an obstacle to the moral conscience of individuals (Lehner and Knoll, 2022). In the meantime, accounting researchers may be forced to reflect on the level of transparency actually required (Losbichler and Lehner, 2021). On the basis of traceability, verifiability and transparency, different perspectives emerge with regard to regulatory requirements and internal advisory systems, as well as important factors such as financial forecasting and planning (Lehner and Knoll, 2022).

As Lehner et al. (2022) discuss, "people generally tend not to trust AI decisions" (Lehner et al., 2022) because most people do not know how machine learning algorithms work (Lehner et al., 2022). In order to successfully integrate AI tools into accounting, accounting professionals need to not only use AI tools, but also trust them and advocate for an active "humanization" of these tools (Lehner et al., 2022). Nevertheless, the users of AI tools must comprehend that the responsibility of humans is not only restricted to the use of machine learning algorithms and their responsibility can be seen as a step towards the promotion of AI tools in accounting (Lehner et al., 2022). The assumption that machine learning algorithms are often poorly understood does not free organizations and individuals from responsibility and proper and secure use of data (Arnaboldi et al., 2017 in Lehner et al., 2022). Organizations would otherwise "create complex systems to help them avoid responsibility" (Lehner et al., 2022).

As advances in artificial intelligence start dominating the corporate sphere, further guidance and organizational restructuring will be needed to maintain control over AI tools while still enjoying their benefits (Lehner et al., 2022). Nevertheless, employees should be able to monitor AI decision making and ensure that moral principles and human judgements are unconditionally respected in these processes (Lehner et al., 2022). Accounting research also needs to consider different societal perspectives on "the ethical implications of AI accounting decision-making" (Lehner and Knoll, 2022). An AI-supported approach to monitoring data-driven strategies must be a socially accepted idea, where the integration of people, businesses and

profit can be found in a process that involves more than just the accounting sector and policymakers (Losbichler and Lehner, 2021).

2.7. Research Questions

The idea of an accounting industry in which humans and machines will in the end complement each other (Losbichler and Lehner, 2021) opens the door for discussions on the future of this industry. On the one hand, there are several opportunities identified in this approach, including significantly improved decision-making, evident cost reductions (Mohammad et al., 2020) and increased financial performance (Adeyelu et al., 2024). On the other hand, the implementation of AI in accounting can present many challenges to accounting professionals, including data reliability and accuracy, job displacement fears (Buchanan, 2005) and serious ethical implications (Loisbichler and Lehner, 2021). Broader ethical implications include privacy violations and algorithmic biases (Adeyelu et al., 2024), while more specific ethical implications include the importance of upholding moral principles, legal challenges of AI integration and cognitive biases of AI tools (Baeza-Yates, 2022). The identified themes serve as a solid basis for the formulation of the research objectives, but also for the introduction of the primary research questions that this thesis attempts to answer.

Research questions should be broad and open to unexpected findings, in order to enable an extensive explanation of this complex research topic (Korstjens and Moser, 2017). The research method must be chosen in a way that does justice to the research question, ultimately connecting research questions with the research context (Hancock et al., 2001). As semi-structured interviews were used to gather insights into this important topic of the opportunities and challenges of AI integration into accounting (De Santis, 2024), this opens up the possibility of asking several main questions that the researcher can discuss with the potential research participants. As the primary research questions also served as a first step for the introduction of the interview guide (Agree, 2019), these needed to be formulated in a way that allowed the researcher, e.g., the interviewer, to easily steer their way through the interview.

Considering the research context and research objectives, as well as the existing academic literature and the identified gaps in the academic literature, the following research questions were proposed:

RQ 1: What opportunities does the adoption of AI tools in accounting offer?

RQ 2: What are the challenges and threats of the adoption of AI tools in accounting?

RQ 3: How are AI tools changing the function that accounting professionals provide to society?

RQ 4: How are the advancements in AI technologies contributing to a compromise between the efficiency gains and challenges to established roles in accounting?

RQ 5: How do advancements in AI technologies impact the ethical and privacy concerns of accounting professionals?

3. Methodology

3.1. Research Design

The first step after exploring the existing academic literature on this topic was to select a research design (Hancock, 2001), which follows the qualitative approach of grounded theory (Glaser, 1992). By combining the inductive approach to the study of social phenomena with the previously formulated research objectives, this thesis seeks to answer the questions of "why" and "what" (Ahmad et al., 2019) the future of accounting might look like. In particular, the research objective which aims to identify the key opportunities and challenges that arise for accounting professionals from the use of AI tools is essential in this context.

In contrast to the assumptions underlying quantitative research, "qualitative methods recognize that the study of people's lives, personalities and experiences involves the likelihood of contradictions and the existence of parallel and conflicting truths" (Winter, 2000). This approach clearly aligns with the formulated research objectives, as this thesis seeks to describe the issues of AI integration into accounting from the perspective of those who experience it firsthand, namely accounting professionals (Ahmad et al., 2019). In particular the research objective of identifying the key opportunities and challenges that arise for accounting professionals from the use of AI tools is particularly relevant in this context. As qualitative research acknowledges "complexity by incorporating real-world context" (Hancock et al., 2001), this thesis attempts to address issues that might be perceived as sensitive not only by accounting professionals, but also by the other two target groups, namely accounting managers, and IT professionals. This is particularly obvious in the research objective of identifying the key ethical and privacy concerns in the use of AI tools.

The qualitative research design, which involves "a constant back and forth" (Croker and Heigham, 2011), also clearly aligns with the research context and the rapidly changing nature of the accounting industry. In order to explore specific aspects of this topic, it is necessary to constantly review the collected data, and the findings derived from it in order to identify additional comparisons and contrasts between the findings (Croker and Heigham, 2011). Qualitative research also involves a variety of techniques that can be modified or developed depending on the needs of the research (Winter, 2000). This clearly aligns with the data collection method of semi-structured interviews, which provide enough freedom for interviewer and interviewee alike to steer the conservation in different directions (Croker and Heigham, 2011).

Another important aspect in the selection of the research design was its feasibility (Croker and Heigham, 2011). The research design is single cross-sectional, which means that the beliefs, behaviors, and interests of the research participants were collected at a specific point in time (Maier et al., 2023). This was the most appropriate decision as the topic of AI in accounting is constantly developing and the data collected can vary not only within a time frame of several years, but also within a single year of observation. Since cross-sectional studies are used to determine prevalence in the population and whether the target sample was exposed to the desired factors at a specific point in time (Mann, 2012), the idea of this research was to measure the current impact of AI on the accounting industry. In addition, one of the benefits of simple cross-sectional research is that it is efficient and cost-effective (Maier et al., 2023).

In order for cross-sectional research to gain "interpretative validity" (Winter, 2000), it is necessary to clearly define and report the sampling strategy (Maier et al., 2023). The sampling

strategy follows the principles of purposive sampling, convenience sampling and snowball sampling and is described in the following section of this thesis.

3.2. Population and Sample

The target group for this research were three groups of stakeholders, including accounting and IT professionals and accounting managers. There were no exclusion criteria for potential industry affiliations, although the interviewees were predominantly employed in the banking industry.

The sampling strategy in this thesis follows the principles of non-probability sampling in qualitative research, more specifically purposive sampling (Shaheen et al., 2019). The idea behind purposive sampling is based on the selection of "information-rich cases" (Shaheen et al., 2019), and unlike probability sampling in quantitative research, "participants are selected according to the objectives and needs of the research" (Shaheen et al., 2019). One of the sampling strategies used in this thesis is homogenous sampling in which a particular subgroup of research participants, in this case accounting and IT professionals and accounting managers, is analyzed in depth (Shaheen et al., 2019). Following homogenous sampling, convenience sampling was used as another sampling strategy as it was a very quick and cost-effective technique of data collection (Shaheen et al., 2019).

This strategy is reflected in the profile of research participants, as most of the interviewees come from the banking industry, which was the most convenient industry for the researcher themselves. Also complementary to the convenience sampling is snowball or chain sampling, where respondents inform the researcher on possible new respondents, leading to a convenient expansion of new insight-rich cases (Shaheen et al., 2019). This strategy is also evident in the profile of research participants, as two of the interviewees, who come from the consulting industry, were identified by using this strategy. By selecting these three sampling strategies, a good number of potential research participants were identified, which ultimately provided more insights than previously expected and simultaneously aligning the strategies with the proposed research objectives.

The selection of interviewees was based on two criteria: 1) professionals who already have gained experience in the implementation or use of AI for accounting purposes (Bilgin et al., 2024), and 2) the research participants should have been able to identify with one or more than one of the three target groups of stakeholders: accounting professionals, IT professionals and accounting managers. To be considered as a potential research participant, both of these criteria must be met. The inclusion criteria ensure the validity and reliability of the findings as they directly address the target population of this research. The exclusion criteria consider already identified potential research participants, who refused to give the consent specified in the consent form "for the collection and processing of personal data for scientific purposes" (Wirtschaftsuniversität Wien, n.d.) or did not stick to the clearly formulated instructions on the collection of personal data. This applies specifically to individuals who originally agreed to participate in the research but did not agree to the storage of audio files and the transcription of their interview. A total of 15 research participants who agreed to participate in the research and fulfilled the inclusion and exclusion criteria were identified. The profile of research participants can be found in Table 1.

After completing the interviews, each of the research participants was assigned a participant ID. Out of the 15 research participants, six research participants are accounting professionals,

four research participants are accounting managers and five research participants are IT professionals. The research participants predominantly work in the banking industry, while two of the research participants work in consulting. All research participants are based in Vienna, Austria. In terms of AI skills, only five research participants have intermediate or higher AI skills, of which three are IT professionals, out of the total of five IT professionals.

Table 1. Profile of research participants

Participant ID	Job Title	Industry Sector	Years Of Experience	Familiary with AI	Location
A1	Junior Accountant	Banking	4 years	Newbie	Vienna, Austria
A2	Senior Accountant	Banking	7 years	Newbie	Vienna, Austria
A3	Financial Accountant	Banking	16 years	Intermediate	Vienna, Austria
A4	Financial Accountant	Banking	20 years	Newbie	Vienna, Austria
A5	Managerial Accountant	Banking	5 years	Newbie	Vienna, Austria
A6	Managerial Accountant	Banking	5 years	Newbie	Vienna, Austria
M1	Product Owner	Banking	8 years	Newbie	Vienna, Austria
M2	Senior Manager	Banking	27 years	Intermediate	Vienna, Austria
M3	Product Owner	Banking	10 years	Newbie	Vienna, Austria
M4	Senior Manager	Consulting	12 years	Newbie	Vienna, Austria
I1	Software Developer	Banking	2 years	Newbie	Vienna, Austria
I2	Software Developer	Banking	5 years	Intermediate	Vienna, Austria
I3	Scrum Master	Banking	15 years	Newbie	Vienna, Austria
I4	IT-Consultant	Consulting	5 years	Intermediate	Vienna, Austria
I5	Software Developer	Banking	4 years	Advanced	Vienna, Austria

3.3. Data Collection

After defining the research context, narrowing down the scope of the research, formulating down the research questions and exploring the existing literature in this field, the next step was to undertake the data collection. Two assumptions that limited the further search in the research sample were data saturation and data sufficiency (Shaheen et al., 2019).

On the one hand, data saturation is a term that describes a situation in which further results provide insufficient in regard to “further themes, insights, perspectives or information” (Shaheen et al., 2019). The “qualitative research method of semi-structured interviews with open-ended questions” (Shaheen et al., 2019) resulted in a large collection of insights from a relatively small sample. There were situations when an interviewee did not relate to a particular question in the interview and therefore could not discuss a lot about the topic. However, this was compensated for by those interviewees who did comment on the same specific questions and provided more than sufficient insights into that topic. Overall, the interviewees provided enough insight at an early stage of the interview process, which also completed the sample size quickly enough.

On the other hand, qualitative research “should be sufficient to allow comparisons between selected dimensions and constructs” (Morgan, 2003). The comparisons should provide sufficient evidence to achieve the cohesive purpose (Suri, 2011), and “the researcher should also ensure that the data collected are sufficient to answer the study's research question” (Shaheen et al., 2019). As the research participants were assigned to one of the three stakeholder groups at the beginning of this research, this has provided a solid basis for comparison between the stakeholder groups. The original idea was that each stakeholder group would have the same number of research participants. The stakeholder group that provided the most insights was the primary target group of accounting professionals, and their insights were the focus of the data collection. Once the data collected provided a coherent basis for data analysis, the focus

was split evenly between the two remaining stakeholder groups of accounting managers and IT professionals.

The sample size was determined according to the principles of purposive sampling in qualitative research, considering “factors such as the scope and nature of the research” (Shaheen et al., 2019), as well as the quality of data (Shaheen et al., 2019). The scope of the research was narrowed down to three specifics aspects of the broader topic in the initial phase of the research in order to achieve rapid saturation (Shaheen et al., 2019). The nature of the topic was familiar to the researcher, which resulted in resources being easily accessible and fewer respondents required for data validity and reliability (Shaheen et al., 2019). The quality of the data depended largely on the research participants' familiarity with the topic of AI in accounting and acquired AI skills, which varied greatly between research participants. Some other factors that influenced the quality of the data were the research participants' ability “to reflect and relate to the topic of AI integration into accounting” (Shaheen et al., 2019). Ultimately, a total of 15 semi-structured interviews were undertaken between June and July of 2024, of which all 15 were included in the data analysis.

The chosen method of semi-structured interviews is not only ideally suited to this rapidly changing issue, but it also closes the gap in existing academic literature, which has so far mainly provided theoretical findings in this field. The researcher is aware of the research topic and the questions that need to be asked but at the same time has enough freedom to allow interviews to develop in different directions (Croker and Heigham, 2011).

The interview guide was created based on the recommendations for creating interview guides in qualitative research from the Sociology Department at Harvard University in Cambridge, Massachusetts (Rosen, 2010). The interview guide covers key perspectives discussed in the research context, objectives, questions, scope of the study and the existing academic literature in this field. The interview guide was primarily structured according to the proposed research questions in order to clearly address specific aspects of this research. Even before the first block of questions was introduced, each interviewee was greeted by an introduction of the interviewer themselves. Subsequently, interviewees were introduced to the research objectives, with no mention of the research questions however, and finally presented with an explanation of measures on data confidentiality.

The interview guide is divided into four different blocks of questions and starts with the block with questions on the interviewee's personal information, including their role in this interview (Rosen, 2010). The first block of questions serves for the interviewer to familiarize themselves with the interviewee and to create a comfortable atmosphere during the interview (Rosen, 2010). Following the first section, the next section consists of questions that attempt to explore familiarity of the interviewee with AI tools, particularly with AI tools in the accounting field. The following set of questions includes questions about the opportunities and threats of AI use to the established accounting tasks, as well as the potential efficiency gains from integrating AI into accounting. Finally, the last set of interview questions is intended to provide insights into the interviewees' ethical and data security concerns regarding the use of AI tools in accounting. At the closing of each interview, each interviewee was asked whether they were willing to obtain a report on the results of the research (Rosen, 2010). A full interview guide can be found in the appendices at the bottom of this thesis as Appendix A.

The data collection process started in June of 2024 and was finalized in July of 2024. During this period, three sampling strategies were used to find potential research participants, ho-

mogenous, convenience and snowball sampling. The recruitment process involved direct outreach to the potential research participants. All research participants were reached via an email containing an introduction of the research project, a brief description of the research project (short summary), the aim of the research project, the contact details of the person responsible and the details of the informed consent form for the research participants. A total of 15 research participants were identified in this period.

Once the research participants confirmed their participation in the research, the availability of both the interviewee and the interviewer determined whether the interview would be conducted in person or remotely. Of the total of 15 interviews conducted, 12 were conducted virtually and three were in person. The rest of the interviews were conducted at the respective interviewee's offices. The duration of the interview varied between 21 and 38 minutes, with an average duration of 29 minutes. All interviews were recorded using the Apple voice memo application and were stored on the interviewer's smartphone and are being disposed six months after the day of the original recording. Research participants actively participated in the interview process, and many research participants required additional clarifications of the process. The interview was opened with the following question:

“Do you agree to recording our conversation for analysis purposes? Your anonymity will be preserved, and no inferences about your personal identity will be possible.”

and interviewees were asked whether or not they agreed to participate in the research under the strong assumption of anonymity and confidentiality of the data. All recorded interviews were then individually “transcribed verbatim” (Hancock et al., 2001) and are being kept for 12 months following the date of the original recording.

3.4. Data Analysis

The first step after the data was collected was to familiarize with the interview transcripts by reading through each one in detail several times to understand the participants' different perspectives about AI integration into accounting and the use of AI tools (Stoian et al., 2018). The following step involved the open coding of the collected data, a process in which short units of content were summarized in a few words (Hancock et al., 2001). This step included the creation of an initial analytical framework, which served as the basis for a comprehensive analysis of the findings. In further analysis, the total of 26 primary codes which were derived from the previous step were categorized into six different sets of codes that correspond with the key aspects of this research (Stoian et al., 2018).

The key aspects of this research include broader topics such as artificial intelligence, job security, governance and legal, accounting perspective, organizational design, and process optimization. Within the set of codes, each code was assigned a unique ID in order to be easily distinguished in the transcripts. These codes fully align with the proposed research objectives, including finding the compromise between efficiency gains and challenges for traditional roles, assessing the impact of AI tools on the role of accounting professionals, and discussing potential ethical and privacy concerns for accounting professionals. The codes were then matched to the text units to allow for a more transparent comparison (Croker and Heigham, 2009). The coding framework, including examples from the data, is shown in Table 2.

Table 2. Coding Framework

Set	Code	Definition/Description	Example
A - Artificial Intelligence	A1 - AI Tools	Which tools are currently used by accountants?	*"We receive the invoice and AI tool helps us to identify all the data from the invoice." (A1)*
	A2 - Efficiency Gains	Overall increase in efficiency, mainly time-saving benefits	*"In my current position, okay, I think I think for now, it doesn't really improve the accuracy, it really just improves the efficiency." (A6)*
	A3 - AI Adoption	Companies are still in the early stages of AI adoption	*"I would say that we are in a very beginner stage. Most of us." (I5)*
	A4 - Chatbots	Daily use of a company-based version of chatbots for writing emails	*"And the whole company uses the same Chat GPT." (A1)*
	A5 - Daily Use of AI	AI tools are largely used for day-to-day business	*"But me, personally, within the scope of the tools that I currently have with just the internal ChatGPT, I wouldn't say it's anything super strategic that I'm doing with it at the moment." (I2)*
	A6 - AI Limitations	Limitations of AI in performing complex tasks	*"What is the result of two plus two? Of course, you get a result, but if you ask artificial intelligence, give me a result of 25.36789 plus 7.89 something, then you do not reach useful." (M2)*
	A7 - Reliability	Concerns about the reliability of AI tools	*"We actually already had issues with wrong validated invoices." (A2)*

Set	Code	Definition/Description	Example
B - Job Security	B1 - Evolving Responsibilities	Roles will change and focus will shift to more on strategic thinking	*"It would really help them to make the overall process more transparent, easier to manage, and with little communication and easier communication. Also new innovative ideas will be coming up." (I5)*
	B2 - Job Displacement	Accountants believe that many concerns about job displacement are unfounded	*„ We can sit here and be afraid of the future and doing nothing and just saying they are taking over, they are taking over." (A4)*
	B3 - Career Development	Accountants need to improve their AI skills to stay relevant on the job market	*"I would encourage them to see how they could use AI to make their existing position or their existing work even quicker or more effective and guide them towards various qualifications that could be being developed in this area" (I2)*

Set	Code	Definition/Description	Example
C - Governance and Legal	C1 - Data Security	The importance of data privacy and security	*"I'm not confident yet enough with the data security practices of using a cloud provider AI tool in the company and I don't know where the data is going." (I5)*
	C2 - Human Oversight	AI can help with tasks, but it cannot replace human judgment	*"Still here, you need human beings that take a look at the process. You cannot fully abandon the process with human intervention." (M2)*
	C3 - Security Trainings	Need for data management practices and security training	*"We have trainings in our company about our things and what is important to do here. But I think the security training should be maybe more focused on private life too." (M4)*
	C4 - Ethical Implications	Additional measures must be considered when handling sensitive information	*"This is also a question who controls AI because there's certainly a kind of central system that saves the infor-mation, shares the information and it's so unclear." (I1)*

Set	Code	Definition/Description	Example
D - Accountants	D1 - Accountant Expertise	Knowledge and expertise of accountants remains essential	*"I think very important because there needs to be a human who understands the deep accounting knowledge at the beginning and end of the process to help define the process and then also check the output of it." (I2)*
	D2 - Accounting Practices	Importance of understanding differences in laws and practices	*"If the accountant has a situation, it must comply with the law. And this is something that you currently cannot replace by artificial intelligence." (M2)*
	D3 - Future of Accounting	Future of accounting will bring great change	*"It will be then probably in future kind of combination of AI and accounting." (A3)*
	D4 - Continuous Learning	Importance of constant learning and skills developing	*"There are a lot of opportunities to gain this knowledge and to learn it. But again, I prefer AI in this term, because it really explains you step by step, every feature, every definition, and I find it very helpful." (I1)*
	D5 - Interpersonal Skills	Demand for accountants will persist due to the need for interpersonal skills	*"Because accounting is still, we work with numbers and it's very, it's digital and automatic, but still, you need the human touch." (A2)*

Set	Code	Definition/Description	Example
E - Organization	E1 - Team Collaboration	Value of teamwork and communication in accounting projects	*"We even are relying a lot on it because we are very much now focusing on having specialized IT teams within the departments to help us out with easily digesting the information." (A5)*
	E2 - Cultural Resistance	Conservative corporate culture can create barriers for digital transformation	*"It's also a big problem for them. I know it from experience because they just said, I am accountant. I'm not really a presenter. I don't have to show the people, you know, standing there for so many people and talking." (I3)*
	E3 - Digital Transformation	Often more discussion about digital transformation than actual implementation	*"There was a big increase in the last three years, I would say, because at the beginning when I started here, it's now seven years ago directly for the position I am now working, it was different." (M4)*
	E4 - Investment in AI	Companies are investing heavily in AI training and software	*"I think we've woken up quite recently and have started to implement programs on educating people on developing softwares on even hiring people who will be specifically focusing on AI development and learning and so on." (M5)*

Set	Code	Definition/Description	Example
F - Processes	F1 - Repetitive Tasks	AI has the potential to fully automate repetitive tasks	*"Accounting work will be a lot easier because a lot of steps would be automated, but there will be a lot of optimization." (A1)*
	F2 - Invoice Validation	AI can speed up the processing of invoices	*"I think in the invoice processing it would be a major, helpful tool." (A2)*
	F3 - Reporting	The future of accounting could include faster reporting cycles and analysis of large volumes of data	*"Because the faster the data moves, the faster you can analyze and make some solutions and see some risks." (A3)*

4. Findings

4.1. AI tools in Accounting

The following section will highlight the key observations on the topic of AI tools in accounting from the insights gained through the semi-structured interviews, including accounting professionals, accounting managers and IT professionals.

4.1.1. Insights from Accounting professionals

Managerial Accountant 1 notes that companies are currently encouraged to implement educational programs and train employees specifically focused on spreading awareness of AI integration to their coworkers. The strive to include current issues in accounting "big data, blockchain technology and artificial intelligence" (Hussein et al., 2024) can also be found in the existing academic literature.

"I think we've woken up quite recently and have started to implement programs on educating people on developing softwares or even hiring people who will be specifically focusing on AI development and learning." **(A5)**

Accountant 1 mentions that their company has appointed a person in each department who is responsible for everything related to AI and digital transformation, who attends meetings and receives specialized training on AI integration. Financial Accountant 1, as one of the program participants, shares their insights about this program too. Initiatives such as AI pioneers can promote the change in an already conservative corporate culture in the accounting industry (Tiron-Tudor et al., 2022).

"For each department my company introduced a special person which is responsible for everything that's related to AI Digital transformation and so on. This exact person will attend a lot of meetings and trainings, which, well, this specific person gets trained at this specific field, like AI and so on." **(A1)**

"I think it's like two or three years long. It should be two or three years long. They have like certain steps and flow because there was estimation of AI knowledge inside the bank and usage of it and it was pretty low. Now the idea of the bank is to make it high because, as far as I know, we have now information portal as well in our knowledge sharing base." **(A3)**

Financial Accountant 1 mentions that their company operates a company-based version of ChatGPT with the locally stored data. They acknowledge using the company based ChatGPT for tasks like email checking, document editing, and summaries, but not yet for accounting tasks. Accountant 1 and Managerial Accountant 1 have also already come in touch with their company based chatbot versions. This is an evident case that the increasing use of various AI chatbots has put pressure on many organizations to implement their own versions of ChatGPT, primarily due to issues of data security and confidentiality (Zahn, 2024).

"We have sort of company ChatGPT, but with protected data. We can use it for, for instance, email check, editing documents, some summaries and so on. But nowadays that's all that we are using. It's not used for our accounting work." **(A3)**

"If we were using the Tesla or which company that Elon Musk and his coworker developed, I wouldn't be very worried. Honestly, for my private life, I'm not using it because I have no clue where my data is going and where the information I'm sourcing is going. However, I do have some kind of, I don't know, belief that our company ChatGPT has a locally stored, whatever cloud database, something exactly where the data is going. There is a little bit more of a privacy in that case. In general, no matter what, let's say you're always exposed to some phishing, to some hack attacks or whatever you want to call it." **(A5)**

"I didn't use ChatGPT so far for any projects because I'm not that into projects. My daily work is mostly just doing accounting stuff." **(A1)**

Managerial Accountant 2 mentions that they use AI for smaller tasks such as translations between German and English, which are often important in larger projects. Financial Accountant 2 highlights the preference for using their company based chatbots instead of tools like Google Translator due to concerns of confidential information getting exposed. This insight highlights the perspective where AI can replace accounting processes at the metadata level (Bizarro and Dorian, 2017).

"Also, sometimes translations from German to English and vice versa. I usually just use it to do like the smaller tasks, the smaller tasks might be related to the bigger project." **(A6)**

"We want to use our own Chat GPT, because they are afraid if we are using, for example, Google Translator, that some confidential words or some things are popping up." **(A4)**

Accountant 2 feels that AI tools like company based chatbots offer endless possibilities, yet it is challenging to incorporate them into their daily tasks. Financial Accountant 1 emphasizes that there are some tools that are not being integrated, but their implementation would open new opportunities for optimizing accounting processes. The issues such as implementation of AI tools is one of key gaps identified in existing academic literature.

"But I mean, especially Chat GPT, it seems like the possibilities are endless. I think it's hard for me personally to incorporate it in my day to day doing." **(A2)**

"For instance, I'm personally looking forward to this personal assistant type of AI tools on laptop that can make you work with your emails, sort them, rearrange them, get data needed, work with documents on the laptop, and as well sort, create different types of documents, like extract data needed." **(A3)**

When asked to rate the importance of AI tools in their current workplace, accounting professionals rated different AI tools with different scores.

"Well, the two we use in the accounting environment are actually very important. If they are working as intended. you mean invoice validation? Yes, yes. If that would work as intended, then that would be revolutionary." **(A2)**

"So actually, I would say two we use it, but not that much. I would say, we could use it way more. But that tool we use, in my opinion, is not very good, as you may know. Okay, maybe because it's a tool that was implemented three or four years ago, which is probably not up to date." **(A1)**

4.1.2. Insights from Managers

Manager 1 emphasizes that their colleagues in accounting use AI tools on a daily basis, but that they do not yet use them on a large sale, which is an experience also shared by Manager 3. These perspectives suggest an early stage of AI integration into accounting, which highlights the cultural resistance towards changes in the industry (Adeyelu et al., 2024).

"I'm aware that colleagues in accounting are using these technologies a lot. But in the area where I am, this improvement lacks a lot, and the problem is because we're working with large quantities of data that we need to analyze. So basically, there are some gaps that I see some opportunities in how and where we can develop them." **(M1)**

"I haven't used yet any AI solution. But my colleagues from the team are using it. I mean, I don't know if it's part of AI, but it's an OCR solution, character recognition for our invoice reading. I think this is also part of AI." **(M3)**

Manager 3 points out that the biggest obstacle for them was not the implementation of AI tools, but the legal requirements that needed to be fulfilled before integration of these tools. This perspective points to the hidden benefits of the AI integration which are often constrained by the costly implementation (Jedrzejka, 2019).

"We have also in our company that our own ChatGPT solution in place. I also received last week the information that it was easy to, I mean, easy in two weeks, colleagues from IT implemented our own ChatGPT, but it took half a year to get from each department like legal compliance and et cetera, the confirmation and authorization to go live." **(M3)**

Manager 2 is also certain that AI tools will eventually be used in a much broader context than is the case today. In addition, Manager 2 is also focused on effectively integrating AI technologies with new group reporting methodologies. As discussed in existing academic literature, digital transformation will be a driving force of rethinking the nature of accounting processes (Strauss and Quinn, 2022).

"I'm currently working on setting up a methodology for a new group reporting. And this group reporting has a different data source. At the end, I really want to connect this data sources with AI." **(M2)**

Manager 3 points to a company initiative called AI Pioneers, which was introduced with the aim of bringing more detailed information about AI solutions to teams. They see AI primarily as a tool for improving and optimizing tasks and have emphasized its benefits in eliminating manual processes like scanning of invoices. As discussed in existing academic literature, since many accounting tasks involve processing transactions at a high level, where there is no need for frequent updates and human judgment, the potential of AI technologies in this field is very high (Kokina and Blanchette, 2019).

"There is a big initiative, AI pioneers, it has started just a few months ago. I think that with colleagues that we dedicated for this initiative will bring to our teams more detailed information so that we can also work on AI solutions and think about how we can improve and optimize our tasks." **(M3)**

"I think that our company is informing very good the people and the employees, and we get a lot of information and trainings. What we also have, for example, everything around AI, we have also a knowledge hub in place where people can get information about AI." **(M3)**

Manager 3 is relatively optimistic about the AI integration in their company. Although AI tools have not been working perfectly across all of their units, AI is already posing as a promising solution for increasing efficiency in their current position. This perspective is supported in the existing academic literature as AI tools can scan for patterns and produce accurate financial forecasts across different divisions which are useful for budgeting, resource allocation and strategic planning (Adeyelu et al., 2024).

"We work always to improve the solution because it doesn't work for a hundred percent for all of our units that we serve. But I think this is already a very good solution and helps us get rid of manual scanning." **(M3)**

4.1.3. Insights from IT professionals

IT Professional 3 acknowledges company support for AI initiatives through training sessions and meetings, such as those focused on company-based chatbots. Nevertheless, they point out that AI is not relevant in their current position and has so far not been extensively used in daily operations. This is in line with the reports that the use of AI in financial organizations is limited, but it has significantly grown in importance in the recent years (Strickland, 2024).

"I think the company is really supporting this because we had many sessions. Also, I had many meetings which explain, for example, Chat GPT." **(I3)**

"If I must summarize it, it's not really important for me. It's my position. I don't really need it." **(I3)**

However, IT Professional 2 emphasizes that they only started using AI tools after their company offered its own version of ChatGPT. They also believe that the importance of AI tools in their current position will only increase in the future. On a scale from one to five, they rate the importance of AI in their current position as a solid three. A big portion of authors also argues

that an open approach to the AI integration is crucial to the promotion of AI in business environments (Naik et al., 2022).

"There is no concern around leaking, or this data being leaked. Personally me, I use definitely ChatGPT, the internal version for work every day because I personally find it easier to start tasks, not from the beginning, but from a sort of template that's been generated for me." **(I2)**

"I would say a three. I could definitely do my position without it, but there are definitely tasks where it makes me quicker and one example, I could give is also rolling out copilot in the Microsoft Office apps themselves." **(I2)**

IT Professional 4 believes that the finance industry has potential for integrating machine learning into its processes but assesses the industry as a whole as conservative and reluctant to make new technological advancements. This perspective repeatedly highlights the cultural resistance to technological changes, which is a common effect of a rather conservative environment in the accounting industry (Tiron-Tudor et al., 2022), particularly in Austria.

"It seems like the finance industry has quite some potential for machine learning, but it's somehow conservative and there is some kind of fear of losing control of the things." **(I4)**

They estimate that 20 to 30 percent of their work could be replaced by AI in future. They also observe a slow adoption of AI in Austrian companies, suggesting that Austrian companies are still in the early stage of AI integration. As Adeyelu et al. (2024) argue, accounting professionals are accustomed to traditional methods and this can lead to widespread skepticism towards AI integration into accounting (Adeyelu et al., 2024).

"If I have to say a number, I would say maybe 20 to 30 percent of my work could be like, could be replaced by AI." **(I4)**

"It seems to me that it's at least in Austria, where most of our customers come from, it's just slowly starting. We're at the total beginning of this process." **(I4)**

4.2. Opportunities and Challenges to Established Roles

The following section will highlight the key observations on the topic of opportunities and challenges to established roles from the insights gained through the semi-structured interviews, including accounting professionals, accounting managers and IT professionals.

4.2.1. Insights from Accounting Professionals

One of the most highlighted benefits of AI integration into accounting in existing literature is certainly time savings (Jedrzejka, 2019). Financial Accountant 1 also emphasizes that the most important benefit of using AI in the future will be time-savings, which will shift the focus to more strategic tasks. Financial Accountant 2, however, believes that many processes not only could, but should be replaced by AI in future.

"When you have more free time for analyzing, you can see sometimes that you're losing time. Because you are doing constantly all the same work. But as well, it will require from you a different type of learning. We are now coming to lifelong learning." **(A3)**

"These bookings at least the reporting, the outcome of the figures from the system and sending to another system in a special way, in my opinion should be automatized. It should be possible. It has to be possible. I still do not understand why it's already now not possible." **(A4)**

Financial Accountant 2 also feels that AI tools could significantly improve work-life-balance by reducing the hours spent on routine and operational tasks. This would allow employees to cut their overtime and instead go home on time. While AI can perform multiple tasks at once, accounting professionals can "focus on higher value-added activities such as optimizing decision-making" (Varma and Singh, 2024).

"No, I don't believe that, because there are so many things, other things that need to be done. We all have so many more hours. So maybe then we do not have this more hours and we can go home on time." **(A4)**

Accountant 2 believes that human judgment is essential in accounting processes due to special cases that even humans find difficult to understand. Authors like Omoteso (2012) highlight that one of the key challenges of AI integration include limitations in developing entry-level skills or allowing for profound human judgments (Omoteso, 2012). Financial Accountant 1 even points out that as AI tools develop, human interaction will be more needed, which is in contrary to some perspectives in existing academic literature, which highlight that the potential of AI in accounting is high particularly due to the lack of need for human judgment (Kokina and Blanchette, 2019).

"Because accounting is still, yes, we work with numbers and it's very, it's digital and automatic, but still, you need the human touch. You will always need it because you always will have special cases that not even the humans can understand." **(A2)**

"The more technical we become, the more precious some kind of human interaction becomes, and it is needed. It will just be better, rearranging and shifting, but it won't be replaced." **(A3)**

Financial Accountant 2 emphasizes that the knowledge and expertise of an experienced accountant is still important to society today. Accountant 1 reinforces this view by pointing out that accountants should develop IT skills in addition to their accounting skills. This perspective is also found in the existing academic literature as new accounting graduates are expected to concentrate on developing skills in consulting, business analysis and advisory services (Greenman, 2017).

"You know, the basis doesn't matter which job you are doing. You need to know the basis. AI is like you replace a person, you teach them to do this job now and mistakes and errors can happen. You need to be in the position to check what was the beginning and is the end what you expected." **(A4)**

"Basic knowledge or upper basic knowledge, I would say will still be important. Because some sort of laws you need are changing all the time and you always have to keep up with

it, keep updated. But also, it would be not just about the accounting knowledge, but even more about technical knowledge." **(A1)**

Accountant 1 predicts that most of the accounting responsibilities will eventually be replaced by AI, which makes it challenging to demonstrate the need for their own position. This is particularly relevant considering increasing technological advancements in the last couple of years. Accounting is also believed to be one of the most affected professions by AI integration and could be significantly transformed in the future (Berikol and Killi, 2020).

"I think it will be hard to show your manager that your job is needed. At least most of the work will be replaced in my opinion, because, when we looked back a few years ago. I don't know, when did AI really start, like two years ago? Like, when did it come big? Compared to two years ago, there was a big shift between the standards of AI." **(A1)**

Managerial Accountant 1 argues that AI could potentially reduce the need for large teams and suggested replacing teams of ten employees with three employees who monitor the machine's work. They, however, view this as a gradual process and not as an overnight event. The issue of job displacement has been actively discussed by many authors in the last decades (Buchanan, 2005).

"If you have a machine which is basically understanding the rules, how intercompany or I don't know, whatever bookings are dealt with, there is no need for ten people anymore, maybe for three, who will cross check that the machine did a proper job." **(A5)**

"We're still far away from that level at least in our company. I mean, we're quite old school and we're still relying on the expertise of people." **(A5)**

Managerial Accountant 2 agrees that AI will reduce the number of working hours required but emphasizes that accounting professionals will still be needed to monitor AI activities. They also believe that those who fear the widespread job losses should instead focus on adapting to these new technologies. The existing research into the role of AI in accounting has also emphasized that the job description of an average accountant will look significantly different twenty years from now (Greenman, 2017).

"I think that AI will definitely reduce the amount of working hours needed, but I don't think it happens so granularly to the point where, okay, now we just don't need accountants, but I think you would still need people, to be supervising whatever the AI is doing, or at least like, let's say, in its current state." **(A6)**

"I mean, I think the main thing that people that are fearful of their jobs because of AI is to really just adopt the thing, like start using it immediately. I think for people to not be afraid of the tool or like, to be replaced by the tool, just go use it, like be on the other side, right?" **(A6)**

Financial Accountant 1 also believes that the main challenge of AI integration into accounting is overcoming the fear of AI and embracing flexibility and the ability to learn new things, once again pointing out to the overwhelmingly conservative corporate culture in the accounting industry (Tiron-Tudor et al., 2022).

"I think the only problem is when people are scared of AI, like try to close all themselves from it, like say they are not into that and what are we going to do? Let's just delete it. Because the only thing that is really challenging is this flexibility and ability to learn new things and new approaches." **(A3)**

4.2.2. Insights from Managers

Manager 2 acknowledges limitations of AI, particularly in handling complex numerical calculations in accounting and controlling. They point out that basic calculations are still manageable, but more complicated calculations may not deliver useful results. This perspective is also highlighted in existing academic literature, as Loisbichler and Lehner (2021) discuss that the human brain is capable of solving problems that exceed boundaries of AI technologies (Loisbichler and Lehner, 2021). Manager 2 also claims that human engagement in accounting processes is still necessary, as full automation is currently not possible.

"In accounting and in controlling, we are working a lot with numbers. When you say AI, please, what is the result of two plus two? Of course, you get a result, but if you ask AI, give me a result of 25.36789 plus 7.89 something, then you do not reach useful." **(M2)**

"But still here, you need human beings that take a look at the process. The process, you cannot fully abandon with human intervention. So currently, I do not see in my area any processes can fully be replaced by artificial intelligence." **(M2)**

Manager 3 can reaffirm this position by pointing out that although machine learning is helpful, quality check will still be needed in their position. Some researchers also highlight this perspective, especially the human role in monitoring and improving the performance of accounting machines (Kokina and Davenport, 2017).

"Of course, it's very helpful to have robotics in place, but it's always necessary to make a quality check, nevertheless. Because for example, a robotics, training it, but sometimes it can happen that the training fails, and you get a wrong solution or wrong outcome. I think there will be always someone needed to make a proper check." **(M3)**

Manager 1 believes that AI can come in handy when it comes to analyzing big volume data under long-term observations. They also see many processes in accounting being fully automated in future.

"We, as accountants, we have to analyze tons of data every month, basically, to make let's say, some sort of reporting for a company, right? We need to ensure that this data is correct, and we need to ensure that we understand what data this is. Yeah, you can train models basically on large data that we that is available for us, for example during the last past last years and you can see the patterns what is posted basically monthly." **(M1)**

„Basically, posting of invoices will be automated very soon. Analytical work will be automated very soon. I think the question is what will not be automated. Not very soon, but in a midterm, let's say. I think the jobs that will prevail are the ones that will focus on steering the intelligence or steering the technology and giving the commands, everything else will be replaced midterm." **(M1)**

Manager 3 also points out that future accounting professionals will likely need to combine traditional accounting skills with AI skills. The so-called "hybrid professions" are also discussed in some papers on AI integration into accounting (Hasan, 2021). They emphasize the importance of being open-minded and willing to learn new technologies. Manager 1 acknowledges this perspective by pointing out that accountants will need to adapt to significant changes to stay competitive on the job market. Nevertheless, neither of them predicts widespread job losses. This is in contrary to some of the pessimistic perspectives in existing academic literature, which argue that technological advances like integration of AI could lead to up to 40 percent of accounting tasks being fully replaced by automation tools (Berikol and Killi, 2020).

"Maybe in future an accountant will not be 100 percent just working on accounting tasks, but maybe it will be a combination of AI and accounting, which means that the people should be open minded and should be willing to learn also on AI solutions." **(M3)**

"There will be always accountants left, but, at least from my perspective, in a form of a really high specialists. This is probably the change. Every accountant will need to adapt to this change. And if you cannot adapt to the future, it will not be very nice for you." **(M1)**

In contrast to the other accounting managers, Manager 1 argues that the main benefit of AI implementation is not timesaving, but instead the increased creativity.

"The generative AI tools or the tools that can really enhance the work or make the work effective are really, you know, like the only first steps being done. But even with this, you can say, look, time saving but not as a priority. I would say for me create creativity, professional communication, and some stuff." **(M1)**

Finally, Manager 2 emphasizes that compliance together with regulatory requirements is an essential aspect of accounting that can never be fully replaced by AI. This perspective goes hand in hand with the idea that accounting professionals may concentrate on "value-adding work" (Woollacott, 2024) in the future.

"If the accountant has a situation, it must comply with the law. This is something that you currently cannot replace currently by artificial intelligence. What you must do in order to replace an accountant, you have to send the artificial intelligence to university and say, okay, go through all these disciplines." **(M2)**

4.2.3. Insights from IT professionals

IT professional 3 is skeptical of full automation of processes. They value the knowledge and expertise of experienced accounting professionals and emphasize the need for understanding of processes and human interaction for the effective use of tools. Although AI might be capable of performing "tasks that could normally be performed by a human" (Hasan, 2021), the need for "moral awareness" (Lehner et al., 2022) will remain crucial in accounting processes.

"In my position, I don't think that any process is possible. Not even the mail sending. I don't know. I don't like this because we are used to any personal, you know, touches. Okay. Maybe I'm old fashioned, you know." **(I3)**

"Yes, because you know, you cannot really, without any knowledge, without any idea, you cannot even search for that, what you need, you know? If you don't have the knowledge in coding, I don't know, topics, you are not even able to search. You're not even able to use the tool." **(I3)**

Although they recognize the potential of AI to support research, they remain reserved about its ability to completely replace human judgment and interaction. IT Professional 1 also believes that human judgment is irreplaceable in accounting processes. Lehner et al. (2022) discuss that as advances in AI start dominating the corporate sphere, the need for monitoring and human judgment will become even more important (Lehner et al., 2022).

"If you are not familiar with some topic and you need more information, you know, to be sure you can find it. But any other process, especially in my position, the people, to see each other, to talk to each other is very important." **(I3)**

"The data that company has is very private and you can't just load everything into AI and say, solve this and do this. This is not professional. Again, I can imagine that the managers could delegate some manual repetitive tasks to AI, but not the expertise of a professional accountant." **(I1)**

On the other hand, IT Professional 4 sees potential in AI for the automation of repetitive tasks, particularly when implementing ERP systems such as SAP. They recognize the efficiency gains that could be achieved by using AI bots and tools to handle routine procedures. As discussed in existing academic literature, AI has the potential to remove repetitive and operational tasks (Kokina and Blanchette, 2019) and to shift focus of accounting professionals to "data-driven and analytical decisions" (Mohammad et al., 2020). IT Professional 2 emphasizes the conservative nature of accounting departments and also highlights the further potential to automate a lot of manual work in accounting.

"For example, during my implementation work there is, so when you like customize an SAP system, there is some repetitive work included. It's when I do this, I always think, okay, oh my God, this could be done like by a bot or something." **(I4)**

"In many companies, this is still the case. They have like three, four, five persons and their daily tasks are like 70 percent of the daily task is to enter invoices. You already see now that this can be optimized, but I think it needs like a shift in the mentality in the management." **(I4)**

"But I would say really, it's automating a lot of the manual work that I've seen that happens operationally. It's a very operationally driven department. As you mentioned, checking invoices, checking amounts, checking that things aren't going over certain thresholds. These are the tasks that I could see via AI being automated and then a summary being given for an account to check with disclaimers that have been found." **(I2)**

IT Professional 4 views AI as a tool for reducing manual effort, but one that is significantly limited by the complexity of organizational structures. They also observe that conservative companies are not willing to adopt these changes due to the cost of implementation. This goes hand in hand with the observations in existing academic literature that the accounting industry is rather reluctant to changes and shifts in regard to the digital transformation topics (Tiron-Tudor et al., 2022).

"I think there is some kind of trade off and as for now, it seems to me like maybe I have bad luck and I'm working with quite conservative companies, but it seems to me that they're not willing to take the step. They are used to this structure they have developed over the past 10, 20, 30 years." **(I4)**

IT Professional 5 also recognizes the fact that many accounting professionals are unaware of the true potential of AI and that this is the cause of many misconceptions and a rather reserved approach to new technologies in the industry. Lehner et al. (2022) discuss this issue and note that "people generally tend not to trust AI decisions" (Lehner et al., 2022) because most people do not know how machine learning algorithms work (Lehner et al., 2022).

"I personally welcome these ideas because most of these ideas are kind of a root cause to be an innovation, to start an innovation, or the starting point where we start our innovation because we get a lot of ideas from the accountants, but they will also have to understand that not everything which is available, which is fine and perfect can be achieved." **(I5)**

IT Professional 3 also emphasizes the need for a reserved approach towards AI developments. They point out that some colleagues are refusing AI tools out of fear of change and a preference for already tested traditional methods. Lehner et al. (2022) note that accounting professionals should not only get used to the innovations that are being offered to them, but also strive to trust them and advocate for an active "humanization" of these tools (Lehner et al., 2022). IT Professional 3 also predict a slower adoption process in the accounting industry. IT Professional 4 also observes the conservative corporate culture in the accounting industry.

"Cause they, every new thing, every change is for them no, thank you. I know how I do it. That's my way of working. I do it every day like this in this way. And then I don't want to change it. They're afraid about the changes. I don't think it will be a really fast, you know, transition." **(I3)**

"Right now, I'm working on a project with a company who is implementing an invoice importing tool with OCR, so all of the invoices get scanned and are then electronically available in the system. But this company doesn't want that these invoices are automatically posted. They want to check every single invoice manually. They are digital, so they don't have to enter the numbers. But in a digital form, they want to check all of the invoices." **(I4)**

"I know it from experience because they just said, I am accountant, I'm not a presenter. I don't have to show the people, you know, standing there for so many people and talking" **(I3)**

IT Professional 5 reports on their own experience with the accounting department, which once again proves how hesitant the accounting industry, especially in Austria, is about the integration of AI (Tiron-Tudor et al., 2022).

"There was a recent poll, we also had it in our company, where we asked that, do you want AI to do everything for you and you want to just watch and take a sip of your coffee? There are four options. The first option is 100 percent, the second option is 80 percent, the third option is 50 percent, and the last option is 10 percent. Most of them opted for the third option, which is 50 percent. They said that I want AI to do everything for, and to do little bit of first level support and my work easier. The final approval or the final work is my responsibility, and I do it. this is perfect." **(I5)**

4.3. Ethical and Privacy Concerns and Future of Accounting

The following section will highlight the key observations on the topic of ethical and privacy concerns and the future of accounting from the insights gained through the semi-structured interviews, including accounting professionals, accounting managers and IT professionals.

4.3.1. Insights from Accounting Professionals

As Financial Accountant 2 mentions, there is already a widespread integration of AI tools in applications such as social media and web browsers and many users are unaware of private data collection through cookies.

"Many people using Facebook and whatever and are not asking about the risk. I mean, there is already AI behind that. All these, how is it called? The browser information, these cookies, that's AI. I'm pretty sure half of the people outside are not aware of it." **(A4)**

Managerial Accountant 2 emphasizes the role of management in educating employees about practical implications of AI integration, particularly about protecting internal information from unauthorized access. This goes back to the idea that the protection mechanisms do not free organizations and individuals from responsibility and proper and secure use of AI tools (Arnaboldi et al., 2017 in Lehner et al., 2022). Managerial Accountant 1 also acknowledges that the key to avoiding potential risks are constant security trainings.

"It comes down to the culture of the people and also like the bank, the management, or whoever is implementing these tools, they have to make the employees understand that, hey, if you do this, it would be like, as if you're going and you're telling internal information to people that shouldn't hear it." **(A6)**

"If you fail those secure threats, basically, you need to do even more awareness trainings. you're constantly being reminded, monitored until you learn." **(A5)**

Accountant 1's perspective emphasizes the importance of safe use of AI tools provided by companies to prevent data leaks. Regardless of security mechanisms, users and developers of AI alike tools should always stay fully transparent about their intentions when working with these tools (Ahmad, 2024).

"As long as I don't use the Open ChatGPT, I'm good because when my work offers me some sort of secure Chat GPT, like whenever I use it, it should be okay for me because when there's like data leakage, it's not my problem, I would say. Because it's only like the company itself has to make sure that the data is secure." **(A1)**

Accountant 2 discusses various AI tools currently available and points out that different employees may use different technologies depending on their needs and security preferences. Managerial Accountant 2 complements this perspective by noting that any available tool can be misused just as much as AI tools. As discussed in existing academic literature, nevertheless, accounting professionals are responsible for ethics of their actions, and they must "be aware of the ethical implications of AI" (Strauss and Quinn, 2022).

"***I mean, if you're being honest, if you don't write it by a computer, you can buy it from someone. I think the people who use this tool before that they use other tools."*** **(A2)**

"I mean, at the end of the day, you're just putting information, like internal information on the tool and the tool is owned by some company. It's the same whether this tool is AI or if it's something else." **(A6)**

Financial Accountant 1 calls into question the data protection guarantees when integrating AI tools, particularly with regard to customer data. They also emphasize the importance of a reserved approach to the introduction of new technologies. This perspective repeatedly highlights the overwhelmingly conservative corporate culture in the accounting industry in Austria (Tiron-Tudor et al., 2022).

"That's a really tough question, and it always pops up when we have some meetings and we are asked to use AI tools more, let's say so, because that's the first question from accountants and from colleagues who are working with client data, like, which guarantees do we have that this data is properly protected?" **(A3)**

Financial Accountant 1 believes that accounting professionals should keep up with the rapid transformation in the accounting industry. Accountant 2 highlights that the issue of mass layoffs should not only also be approached by organizations, but also by governmental institutions. Financial Accountant 2 notes that accounting professionals should be more engaged in reshaping the future of the accounting industry today. There is an overall consensus in existing academic literature that an approach of openness to AI innovations by all stakeholders involved is a key factor in promoting trust and efficient use of AI tools (Naik et al., 2022).

"I think it will be less technical accountant, accountants like they just copy pasting something or just putting figures, but there would be more intelligent accountants." **(A3)**

"I think the people should maybe, you know, start thinking about another direction within the company, for example, because I think, yes, it definitely will be the case. The more AI develops, the more people will be laid off, but I think it's the not only the issue of the company, but from, I think, the state." **(A2)**

"We can sit here and be afraid of the future and doing nothing and just saying they are taking over. Yeah, it doesn't matter if people taking over our jobs in other countries or if the system is taking over, we need to take the active part and be more involved into it." **(A4)**

4.3.2. Insights from Managers

Manager 2 sees no threats such as privacy risks from AI and credits this confidence to the expertise of their IT department and the use of company-based models. They also acknowledge the data security measures adopted by the European Commission. This goes hand in hand with the regulatory developments on EU level. Earlier this year, the European Union (EU) introduced the EU AI Act, which provided developers, deployers and users alike with clear guidelines on the use of AI (European Commission, n.d.). Beside this important development, Manager 3 also highlights the cyber protection coming from within the company and their IT department.

"I do not see here any threat from my perspective because we have a very good people in the IT department. What they are doing is we are only using our own model; we invest in artificial intelligence in our own models." **(M2)**

"I think we have in the European Union a very good data act here on that topic. We are quite safe from that point of view." **(M2)**

"I mean, in our company it's very crucial to use, for example, just our own solution. What is also very important, in case we are using a non-company site, not to put any non-public information. We always have compliance trainings in place where this kind of information are then trained to us." **(M3)**

The issue of moral hazard and free-riding due to the use of AI either does not concern the managers or they are not really informed on this topic.

"I mean, maybe I don't have so many concerns. Maybe it would be good to get some information from another manager." **(M3)**

"Basically, I was not informed about any threat. I was informed about the threats that are relevant to the AI act to the laws regarding, basically, loss of data." **(M1)**

"If you are an employee and you say, I am an accountant and if I'm doing research, let me put it, research, how something is booked, then this is a positive, it's a positive behavior. From my experience, that's not a threat because, if I pretend, I'm accountant and I'm not, that I have to do my research with ChatGPT, sometimes it gets so cumbersome to say, okay, no, I look for another position." **(M2)**

In regard to the future of the accounting industry, Manager 3 believes that older employees may be more fearful of AI. Instead of discussing the massive layoffs, they believe that the employees who leave the company will most likely be replaced by AI, rather than by new employees. This goes hand in hand with the discussion in existing academic literature that accounting will be one of the fields that technological advances will improve in the upcoming decades, but which will not result in a full automation of processes (Davenport and Kirby, 2016).

"I think many people, more the older ones are afraid of AI. But I think we should take it as an opportunity because when thinking about in the past, what already changed, with, you know, PCs and mobile phones and whatever. I think it's very important to inform the people and to show them what kind of opportunities there are." **(M3)**

"I think what will change maybe is that the people who are close to their retirement will not be replaced. For example, that's why it's important to think about AI solutions also and to think how those people can be replaced with AI." **(M3)**

Manager 2, while predicting a difficult future for the accounting industry, still believes that AI will not replace accounting professionals, not even under long-term observations.

"Difficult, difficult. Because, as I told you, as long as you do not have a model that was trained by the university, you cannot replace an accountant. I told you, when you, for ex-

ample, as a general manager, and when you're going to accounting, you need so much of knowledge about laws, about different countries, behaviors, different country laws." **(M2)**

"You cannot replace people. That's the topic here. I see probably in 100, 200 years, for example, you can replace the accountants with artificial intelligence, but I don't see it in the future." **(M2)**

4.3.3. Insights from IT professionals

IT Professional 3 is reserved about the extensive use of AI, particularly due to the sensitivity of the data they process. IT Professional 5 can only acknowledge this perspective by pointing out that the misuse of data is a big topic right now, even in IT departments. This goes hand in hand with the evident concerns in existing academic literature about the integrity of AI-supported decision making (Loisbichler and Lehner, 2021).

"I don't think so, especially in my company, it's not good to use AI for everything because we have really data, which should be, dealt very carefully, also personal data." **(I3)**

"ChatGPT could generate Windows XP keys, serial numbers, or the access keys using various combinations. These are now restricted, but this is still possible that it can find out. If it has information, ChatGPT doesn't know if it is authorized or not authorized, but it will do anything to provide you the information. It can also hallucinate. It can also like create the data from randomly some from somewhere, and you will never feel that the data is incorrect." **(I5)**

IT Professional 4 admits that the integration of AI is unavoidable largely due to gradual increase in data volumes. Kokina and Davenport (2017) argue that in some cases, a human approach to "analytics is not possible anymore due to the large volume of data" (Kokina and Davenport, 2017). IT Professional 1 can only agree with this perspective and point out that, as with any other innovation, its use depends on the responsibility of the individual using it.

"I think if they are using AI, there is so much data that they don't have the chance to not rely on the AI. If they don't want to rely on AI, then like the database has to be smaller and then they possibly don't really need AI. But I would agree there is like, there is a certain danger of misinterpretation of the data." **(I4)**

"Yes, but this is the very natural thing of every technological innovation, that on one side it has innovative side, but also it has a very would say risky side, but this is a normal thing. And that's, I think the responsibility professionals to kind of not to be afraid of it, but kind of learn it and use it for my advantage and use it for my support." **(I1)**

IT Professional 5 emphasizes that even the most computer literate employee cannot be sure about data security when using AI tools, not to mention accounting professionals without particular computer skills. As Arnaboldi et al. (2017) argue, the assumption that machine learning algorithms are often poorly understood does not free organizations and individuals from responsibility and proper and secure use of data (Arnaboldi et al., 2017 in Lehner et al., 2022).

"Because even myself, I'm not confident yet enough with the data security practices of using a cloud provider AI tool in the company. I don't know where the data is going. Is it in Europe or in Middle East or in Asia? How the data will be used, it's not in my hands." **(I5)**

As for the future of accounting, some of the interviewed IT professionals agree that there will be mass layoffs and that this process is inevitable. Others, however, believe that this fear is exaggerated and that accountants will not be replaced in the near future. This is in contrary to the prevailing perspective in existing academic literature that the extensive use of AI in accounting could lead to a potential increase in income inequality, lower demand for labor force, lower financial security, and similar consequences for accounting professionals (Zemankova, 2019).

"An accountant who is doing the invoices, I would say, okay, better think of it and, try to find another job." **(I4)**

"Yes, I think that's inevitable (staff reduction). But again, I think that AI would also bring new advantages and new professionals and new positions with it too." **(I1)**

"I personally think this is overblown. I think I touched on it before, but especially in my area, I think it's overhyped and I think it will make people who utilize it much more effective and people who don't utilize AI at all could be left behind or they could be less effective. But I currently, I don't see it replacing entire positions or headcounts based on what I've seen so far." **(I2)**

"Accountants cannot be replaced as of now. Because the way the process is not predesigned with accountants. The accountants are free to come up with the new designs and the AI adapt accordingly. And the AI designs or AI process cannot be completely twisted as of now." **(I5)**

5. Discussion

5.1. Key Findings Accounting Professionals

In order to understand perspectives on this important topic and draw comparisons, the findings are discussed based on different pairs of accounting functions: accountants, managerial accountants, and financial accountants.

Both Accountant 1 and 2 believe that significant changes have not yet been integrated into their daily work. Both accountants acknowledge that current AI tools that are being implemented, for instance the automation of invoice validation, do not significantly improve efficiency in their current position. This is in contrary to the prevailing perspective in existing academic literature that AI tools will most likely serve to increase efficiency in accounting processes in the future (Hasan, 2021). According to both accountants, AI tools such as OCR invoice validation and the company's internal ChatGPT are currently only used to a limited extent. Both accountants mentioned that the implemented AI tools currently cause more issues than they bring benefits. Both accountants expressed an obvious lack of understanding of the full capabilities of the implemented AI tools. Both noted that the use of existing AI tools leads to more time being spent on verifying results than actually working with data. In order to overcome this issue and other challenges that accounting professionals are currently facing,

stakeholders such as educators, policy makers and practitioners need to work together to fully unlock and promote the potential of AI technologies (Hasan, 2021). Both accountants also note their company provided training practices about AI tools, but that these did not bring much added value, as employees still mostly rely on their personal knowledge instead. Nevertheless, the assumption that machine learning algorithms are often poorly understood does not free organizations and individuals from responsibility and proper and secure use of data (Arnaboldi et al., 2017 in Lehner et al., 2022).

Both accountants believe that AI will gradually reduce the number of traditional accounting tasks, which goes hand in hand with predictions that up to 40 percent of responsibilities of accounting professionals will be shifted in the future (Berikol and Killi, 2020). Both accountants agreed their tasks will most likely be transformed but that they will not disappear in the future. One of the main reasons for this is the constant need for interaction with clients and other departments in the company. As discussed in existing academic literature, accounting professionals should concentrate on acquiring additional skills such as consulting, business analysis and advisory services (Greenman, 2017). Both accountants share a positive outlook on the future of accounting despite the increasing dominance of AI tools. Accountant 2 also expressed concerns about the ethical implications of using AI tools, particularly regarding the use of AI by inexperienced colleagues, which in the end might lead to unfair advantages.

The financial accountants emphasized that AI is being integrated into their company's processes, but only for tasks such as checking emails, scanning documents and translations. This aligns with the assessment by Bizarro and Dorian (2017) that accounting processes at the metadata level, such as source documentation, paperwork and emails will be the first responsibilities to be replaced by AI in the future (Hasan, 2021). Both financial accountants believe that AI will significantly improve processes and shift responsibilities to more strategic and analytical tasks, which aligns with the perspectives in existing academic literature that place emphasis on shift to “data-driven and analytical decisions” (Mohammad et al., 2020). Neither of the financial accountants were concerned about job security and saw AI as a supporting tool rather than a replacement for accounting professionals. They emphasized that future accounting professionals will need to understand basic principles of accounting in order to handle complex scenarios, which AI is currently not capable of doing. Both financial accountants demanded more rigorous and visible policies on AI use in their company. As highlighted by Lehner et al. (2022), further guidance and organizational restructuring will be needed in the future in order to maintain control over AI tools while still enjoying their benefits (Lehner et al., 2022). Both financial accountants emphasized that AI integration could result in faster reporting cycles and better management of large volume of data.

Managerial accountants see things somewhat differently. Both managerial accountants recognized their companies' efforts to partake in digital transformation initiatives, but both acknowledged that Austrian companies are still significantly lagging behind global technology leaders. Both Managerial Accountant 1 and 2 mentioned that AI tools were not particularly important in their current position, but that future projects might increase their reliance on them. Both managerial accountants acknowledge that cultural resistance plays an important role in how new technologies are adopted in organizations and emphasize the importance of supportive organizational structures. This goes hand in hand with the idea that cultural resistance to technological changes is a common effect of the conservative corporate culture in the accounting industry (Tiron-Tudor et al., 2022). Both managerial accountants emphasize the need for pronounced data management and staff training. Both managerial accountants believe that accounting professionals will be required to further develop their skills to keep up

with AI dominance. Managerial Accountant 1 strongly believes that new technologies could significantly reduce the need for accounting professionals in the future. This aligns with the perspective of Kokina and Davenport (2017) who argue that the increased use of AI tools could potentially halve the annual inflow of new employees and significantly change employment possibilities in the accounting industry (Agnew, 2016).

The accounting professionals interviewed admit to using AI tools for tasks such as checking emails, processing documents and translations, as discussed in Bizarro and Dorian (2017), but their use in core accounting functions remains limited across all three interviewed groups. All three groups acknowledged that their organizations are actively working on promotion and AI integration into accounting, but they rate their progress as rather slow and inconsistent. This is also highlighted in existing academic literature as researchers agree that educators, policy makers and practitioners need to work together to fully unlock and promote the potential of AI technologies (Hasan, 2021).

Accountants are the least optimistic of the three groups when it comes to AI dominance. They also feel less informed and less integrated when it comes to understanding and using AI tools. Compared to the other two groups, accountants are also more skeptical about the effectiveness of AI tools. While accountants are skeptical about efficiency gains, financial accountants expect significant improvements through the integration of AI, especially in the area of financial reporting. All three groups emphasize the need for monitoring and collective awareness of potential privacy risks related to the use of AI tools. The idea of "moral awareness" (Lehner et al., 2022) is crucial in this context as it should be integrated in all steps of accounting processes when using AI tools (Lehner et al., 2022). Nevertheless, the issue of job security is perceived differently by different groups. While financial accountants and accountants are not worried about their professional future, managerial accountants believe that there will be some personnel reduction in the future.

5.2. Key Findings IT Professionals

IT professionals agreed that the increasing dominance of AI tools should be viewed as an opportunity to increase productivity and efficiency of employees rather than a replacement for accounting professionals. They predict "a future where AI tools will play an active role in accounting" (Pastva et al., 2024), especially in operating repetitive tasks, which aligns with the prevailing perspective on this topic in existing literature (Hasan, 2021). All IT Professionals agreed that the transition will be gradual due to the conservative nature of the accounting industry, once again highlighting the cultural resistance to technological advances in the industry as a whole (Tiron-Tudor et al., 2022). IT professionals interviewed noted that many companies are taking a reserved approach to AI integration into accounting, which is primarily influenced by strict legal frameworks and evident management resistance. Just like accounting professionals, IT professionals also believe that constant learning and skill development is necessary in order to remain relevant in the transforming accounting industry. All IT professionals expressed fears about data privacy and protection, regulatory issues, and ethical implications of using AI tools (Drenik, 2023).

There is a major area of disagreement concerning the idea that AI will lead to widespread personnel reduction. Some IT professionals believe that the accounting profession will disappear completely, others believe that some accounting tasks will disappear, and others will be transformed, but the new opportunities will definitely emerge. This goes hand in hand with a

perspective that financial services are most likely to be supported, if not completely dominated, by robots in the future (Jedrzejka, 2019).

IT professionals disagree on the level of integration and use of AI, the management approach, training initiatives, and optimism about the potential of AI. IT professional 1 rated AI tools as important to their current position, while IT Professionals 2, 3 and 4 expressed limited use and skepticism about their immediate impact. IT professionals 3 and 4 highlighted a reserved approach of their organizations to digital transformation initiatives. While IT Professionals 1 and 2 are more enthusiastic about digital transformation processes in their organizations, IT Professional 3 emphasizes the overall conservative attitude of the accounting industry towards this topic. IT professionals universally expressed concerns about the ethical implications of AI integration, including data privacy and the potential misuse of sensitive information which is entrusted to accounting professionals.

Most IT professionals interviewed recognized the potential of AI to increase efficiency, automate repetitive tasks and support various accounting functions. This is supported by the functions of AI mentioned in existing literature, such as simple number analysis (Kokina and Davenport (2017), which is categorized as “automation of repetitive tasks” (Kokina and Davenport, 2017). However, IT professionals agree that accounting professionals will still be needed for tasks that require active human intuition in the context beyond what AI can provide. This goes hand in hand with the perspective that the human brain constantly solves problems that exceed the boundaries of AI technologies (Loisbichler and Lehner, 2021).

The major area of disagreement is the topic of personnel reductions and the future of accounting. While IT Professionals 1, 2 and 4 see AI primarily as a supporting tool and believe that its dominance will not have severe consequences for accounting professionals, IT Professional 3 believes that many accounting tasks could be replaced by AI in the next decade. This aligns with the perspective that up to 40 percent of all accounting responsibilities could undergo automation in the future (Berikol and Killi, 2020). Nevertheless, all IT professionals interviewed emphasized the need for constant monitoring of accounting processes to guarantee the reliability and accuracy of the results. Although companies support the use of AI and offer many training courses and meetings to inform employees about AI tools, general acceptance of AI tools, especially in Austria, is still at an early stage. Some IT professionals see limited potential for AI integration into accounting and prefer interpersonal skills over full automation. IT professionals agreed that in order to overcome resistance and effectively integrate AI into accounting, it is important to address these concerns and promote a deeper understanding of the benefits and risks of AI. For this reason, key stakeholders such as educators, policy makers and practitioners need to work together to fully unlock and promote the true potential of AI technologies (Hasan, 2021).

5.3. Key Findings Accounting Managers

With regard to the topic of digital transformation, Manager 1 and Manager 2 mentioned that their organizations were taking a step-by-step approach rather than making radical changes. Manager 3 highlighted that there is often more talk about digital transformation initiatives than their actual implementation, once again highlight the corporate conservative culture in the accounting industry in Austria (Tiron-Tudor et al., 2022). They also noted that their company has digitized invoices in order to reduce printing costs and minimize paper use. This decision aligns with the general objective of using digitalization to increase efficiency.

All four accounting managers agreed that AI has the potential to support many accounting tasks in the future (Musleh Al-Sartawi et al., 2024), particularly repetitive tasks in their daily business such as invoice and data entry. Accounting managers 1, 2 and 3 emphasized that AI can increase efficiency of accounting processes and highlight the possibility to analyze large volumes of data. This perspective is supported in existing academic literature as Kokina and Davenport (2017) argue that human approach to analytics is simply not possible anymore due to the large volumes of data (Kokina and Davenport, 2017). Managers 1, 2 and 3 also predict a future of accounting profession where accounting professionals have hybrid roles that combine traditional accounting skills with a certain level of technological expertise. This goes hand in hand with the idea of hybrid professions that "are expected to develop and lead the profession in the near future" (Hasan, 2021). Manager 4, however, believes that AI can support some simple tasks, but that the accounting expertise is irreplaceable in their organization.

As for the issue of monitoring, all four accounting managers emphasized that AI output should always be validated by experienced accounting professionals, who are needed for tasks and quality control. Manager 2 emphasized that the knowledge and expertise of experienced accounting professionals is needed when dealing with complex legal requirements and issues in corporate governance. As discussed by Huang and Rust (2018), "the frequent changes in laws and regulations, which would require AI tools to be regularly updated" (Hasan, 2021) are another barrier to the use of AI. All four accounting managers also highlighted the importance of constant learning and improving accounting skills and knowledge in order to remain relevant in the transforming accounting industry.

On the topic of personnel reduction, Manager 1 and Manager 3 expressed general fear about job insecurity because of the increasing AI dominance. Both managers believe though that AI tools will primarily support and not replace accounting work. This goes hand in hand with the perspective that accounting will be one of the fields that technological advances will improve in the upcoming decades, but which will not result in a full automation of processes (Davenport and Kirby, 2016). Manager 2 also mentioned that as much as AI can eliminate some accounting jobs, the depth of accounting knowledge will still be necessary to facilitate accounting processes in the future. Managers 1 and 2 were slightly optimistic about the AI integration into accounting, emphasizing that some job tasks may change, but this will not lead to mass layoffs in the future. Some accounting managers believe that AI would only partially replace accounting professionals (Manager 1), some believe that AI would transform their function (Manager 3), while others believe that it would act as a support tool (Manager 2 and 4). This is in contrary to predictions that the extensive use of AI could lead to an increase in income inequality and lower demand for labor force (Zemankova, 2019), as none of the accounting managers believe that the dominance of AI will inevitably lead to widespread job losses.

With regard to the topic of ethical and privacy concerns, Manager 1 chose data leakage as a major concern when using AI tools in accounting. Manager 2 believes that constant learning and updating of regulatory requirements is necessary, as AI would not be capable of handling this issue in the future. Manager 3 highlighted the importance of regular training on data protection in order to avoid risks related to the use of AI tools. Both Manager 1 and 2 highlighted that the results provided by AI can be unreliable and that the careful monitoring of accounting processes will be even more important in the future. This perspective is supported in existing academic literature as AI goes against traditional accounting methods that completely rely on human judgment (Munoko et al., 2020).

With regard to the topic of cultural resistance, both Manager 1 and Manager 3 noted that there is a general resistance to technological advancements in the accounting industry. These 2 accounting managers also discussed the need for constant collaboration with the accounting and IT departments to facilitate effective integration of AI into accounting. They noted that they have been actively encouraging their employees to ask questions about AI tools in order to promote an open learning environment. Accounting managers 1, 2 and 3 all emphasized the importance of teamwork in implementing new technologies (Kuzmenko et al., 2023), except for Accounting Manager 4, who places emphasis on the individual willingness to adopt AI solutions.

It is evident that there is a push to actively explore AI tools in the accounting industry in order to improve operational efficiency, particularly in areas such as group accounting and reporting. All four accounting managers agree that AI is being introduced gradually into their organizations, but they are all concerned that there will be mass layoffs in the future. Some accounting managers predict that the workload of accounting professionals could be reduced by up to 75 percent in the future, while others believe that complex tasks would still require monitoring skills and human judgment. This perspective is supported in existing literature as some researchers argue that payroll and simple bookkeeping could be one of the accounting fields most affected by the extensive use of AI in the future (Berikol and Killi, 2020).

6. Conclusion

6.1. Research Limitations

It is necessary to acknowledge that the key findings should be taken with skepticism due to limitations in research design, population and sample, data collection and data analysis. This section will discuss how each of these limitations affect the main findings.

One of the most evident limitations that might have affected the findings is the selection of qualitative research methods, particularly considering the premise that the data interpretation in qualitative research is rather indefinite (Ahmad et al., 2019). Although qualitative research is able to answer the “why” and “how” research questions (Ahmad et al., 2019) and provide a more in-depth analysis of social phenomena, it cannot answer the no less important “what” questions (Ahmad et al., 2019). In this context, the significance of this thesis could only be partially expanded. Instead of using semi-structured interviews, which offer the sufficient flexibility but can also deliver ambiguous results, the quantitative research could have included “methodologies such as questionnaires, structured observations or experiments” (Ahmad et al., 2019), in order to provide for numerical comparisons of the current trends in this field. The methods discussed could have also established a more numerical relationship between the insights of the three stakeholder groups involved. The structured observations and experiments could have helped identify the cause and the effect (Hancock et al., 2001) of the specific aspects of this thesis. In contrast to qualitative research, quantitative research takes as many cases as possible in order to solidify the representative aspect of a study (Ahmad et al., 2019).

An important limitation that might have influenced the findings is the research design, particularly the single cross-sectional analysis of the research. In total, 15 semi-structured interviews were undertaken in June and July of 2024. Due to the short timeframe of data collection, the research design may have been limited in its ability to establish “temporal causality” (Maier et al., 2023). The semi-structured interviews could therefore represent only a recap of the findings on “the target population at a specific point in time” (Maier et al., 2023). Even at

the time the interviews were conducted, AI tools, such as company-based versions of chatbots, were still in development and interviewees were pretty much evenly divided on their functionality. There is a possibility that the findings would have been different if interviewees were asked the same questions today. One way to avoid this issue was to place emphasis on the AI tools that have been in use for some time and whose efficiency the interviewees were able to access successfully. One of the target AI tools that was inspected was OCR invoice validation, which had already been in place for months prior to the interviews. Future research can address this issue by conducting longitudinal rather than cross-sectional research. In longitudinal research, the same target group would be observed repeatedly over a longer period of time to track changes in findings (Bala, 2020).

One of the reasons why the findings may not be transferable to a wider population is possible bias in data collection. Due to the difficulties in the initial stage of interviewee selection, the selected sampling strategies were convenience and snowball sampling. The topic of AI integration into accounting is current, but it is still largely undiscovered, even by most computer literature accounting professionals. Quota sampling was not possible, even though the main objective of this thesis was to compare different subgroups that are impacted by the topic of AI integration into accounting, including not only accounting but also IT professionals and accounting managers. Finding accounting professionals willing to contribute to this research was not an issue but finding accounting managers willing to share their insights on this important topic was an obvious obstacle.

The recruitment process was also filled with difficulties, as the only way to approach potential research participants directly was via email. In this case, the snowball sampling had to be used, as the research participants who had already been interviewed helped to reach other potential participants and helped collect their personal data and contact information. The availability of interviewees and the interview setting can also be seen as one of the limitations in the data collection process. Although the original plan was to conduct all interviews in person, 12 out of 15 interviews were conducted remotely. Although the interviewees were informed that the originally planned interview duration was around 45 minutes, the 40-minute mark was not reached in any of the interviews due to unpredicted time constraints. Another limitation was that the Apple application voice memo, which provides low quality recording functions, was used to record interviews, Instead, portable digital voice recorders could have provided better sound quality and a simpler basis for transcription.

The inclusion and exclusion criteria could also have significantly influenced the findings. Not only did the research participants have to identify with one or more than one of the three targets stakeholder groups, but they also had to have already used AI tools in their current position. This meant that the beliefs and behaviors of potential research participants who might have had a lot to discuss on this subject but were not included in the sample, were in the end not considered in this research. The research participants who have met the inclusion criteria but did not stick to the clearly formulated instructions on the collection of personal data were also not included in the sample, and the absence of their insights could have also affected the findings.

Due to the difficulties in finding accounting managers who were willing to participate in this research, a quota sampling strategy was not possible. The final sample size includes a disproportionately large number of participants from each group, namely 6 accounting professionals, 5 IT professionals and only 4 accounting managers. Additionally, none of the final research participants were able to identify with more than one stakeholder group, suggesting a

lack of cross-divisional perspective from the research participants. This could have impacted on the validity of the findings (Maier et al., 2023).

As convenience sampling was the preferred strategy for selecting interviewees, only easily accessible experts from each subgroup were selected for interviews, which may have influenced the findings and led to some bias in participants' responses. There were often questions where interviewees would not provide much insight into one particular topic, solely due to their unwillingness to engage with a particular topic that was not relevant to them. This was the case whenever an accounting professional had to engage with an IT topic and vice versa. One way to partially avoid this problem was the method of data collection itself – semi-structured interviews, which allowed the interviewer to steer the conversations in different directions depending on the interviewee's preferences, beliefs, skills, and knowledge of this topic.

On the one hand, the interview guide was structured in a way that allowed both interviewer and interviewee to guide the conversation in different directions (Croker and Heigham, 2011). Although the interviewees were given enough freedom to engage with the interview questions, there were situations where an interviewee did not relate to a particular question in the interview and therefore could not discuss much about that particular topic. This led to a lack of insight from certain research participants, which necessarily had to be compensated for by the other "insight-rich cases" (Shaheen et al., 2019) on that particular topic.

On the other hand, the interview guide could not include all the important aspects and research objectives of this thesis due to the time constraints of the interviewees. This could have strongly influenced not only the key findings of the research participants, but also the discussion and the connection to the research questions. The interview setting could also have had a major influence on the findings. Of the total of 15 interviews, 12 were virtual and three were in person. It is noticeable that the average duration of the three in-person interviews was almost two minutes longer than the average of the 12 interviews virtually conducted. Not only were the in-person interviewees more engaged, but the interviewer was also more open to discussing certain questions, which most likely led to more insightful responses.

It is also necessary to consider the current contextual and environmental factors such as the prevailing reluctance towards AI expansion and cultural resistance within the accounting industry. The interviews were conducted at a time when the importance of AI was rapidly increasing and the main aspects influencing the discussion on AI integration into accounting were the shifting responsibilities, job displacement and ethical implications (Buchanan, 2005). In terms of environmental factors, the main aspects that prevailed during this period were the lack of a digital transformation strategy, insufficient AI investment and the overall conservative corporate culture of the accounting industry (Tiron-Tudor et al., 2022). Furthermore, only the most current aspects of process optimization were discussed, such as AI support in invoice validation.

Another important limitation with regard to data collection were demographic restrictions, particularly the geographic location and industry affiliation of the interviewees. Although the focus of the research was to explore the insights of different target groups based in Austria, the target sample includes participants from Vienna and the Vienna metropolitan region only. This could have misrepresented the findings as companies in Vienna are the pioneers in regard to digital transformation. Future research could instead focus on experts whose companies are located outside of the Vienna metropolitan region, in order to get a clear picture of

the AI developments in Austria. Industry affiliation also played a major role when it came to comparing the findings between the interviewees. Of the 15 participants, 13 are employed in the banking industry. Like any other industry, the banking industry has its own unique characteristics, and it is not possible to project the findings from this industry alone to the general accounting field. Future research could address this issue by narrowing down the industries in which accountants are commonly employed and then using the quota sampling to get sufficient insight from each target industry.

In terms of limitations in data analysis, the most obvious constraint is the lack of coding software. Instead, the open coding method was used to develop the coding framework, which required the interviewer to familiarize themselves with the transcripts by reading through each one several times (Stoian et al., 2018) and summarizing short units of content in a few words (Hancock et al., 2001). The 26 primary codes were determined by the interviewer themselves, and the codes may not be as accurate as those possibly provided by analytically superior coding software.

6.2. Research Implications and Future Research Directions

An important question following the findings is what the practical implications of this research are. It can be assumed that accounting professionals are at risk, if not of being completely replaced by automation tools, then definitely of having their responsibilities and tasks significantly reduced. Both existing academic literature and interviewee insights have shown that AI will not be the only driving force of change in the accounting industry, but also many non-AI based tools that can speed up automation processes, such as RPA. One interpretation that has been neglected by both the literature and interviewees is that accounting professionals may not be direct, but rather indirect victims of mass layoffs. This means that as technology advances in the future and automation and AI tools take over traditional accounting tasks, individual employees will slowly face a lack of responsibilities in their day-to-day operations. This will lead to various positions being merged as there will no longer be a need for as many employees with identical roles in the company as is the case now. This will inevitably lead to many layoffs as part of the cost optimization strategies. This means that traditional human accounting will still be needed, as the core tasks of accounting professionals will remain, and they will not be replaced, but the restructuring measures will lead to widespread job losses. It seems that accounting professionals are not yet aware of this perspective.

This particular finding is also a signal to accounting managers, as they will be at the point where they will need to evaluate AI potential in order to take the right actions, including decisions on team restructuring. In addition, the accounting professionals interviewed did not seem very eager to discuss the potential shift in responsibilities in their positions. While the existing academic literature on this topic suggests that new accounting graduates should focus on consulting and advisory services (Greenman, 2017), this perspective is still very much neglected by practitioners. Most of the accounting professionals interviewed see their roles as unchanged, apart from the elimination of repetitive tasks, once again confirming the cultural resistance to technological advances in the accounting industry as a whole (Tiron-Tudor et al., 2022). IT professionals would not be spared from current developments either, as those unwilling to adapt to changes and coexist with AI risk being replaced by it. Although these developments open the door to new roles in the IT industry, such as assisting with the implementation of new AI systems (Lehner and Knoll, 2022), as well as updating and maintaining old ones, interviewees generally seem unaware of these opportunities. IT and accounting de-

partments need to work closely together to close these gaps, otherwise they risk being completely overtaken by the AI solutions in the future.

Most obvious implications are the ethical implications, which can seriously affect the day-to-day business of accounting professionals and managers. Remarkably, the findings show that accounting managers were mostly unaware of the potential privacy risks and consequences of misusing AI tools. This is surprising given the fact that the existing academic literature points to the need for constant monitoring (Hasan, 2021), which should be carried out primarily by accounting managers. Accounting managers will need to understand that they are not only responsible for their own use of AI tools, but also for managing the overall AI deployment at team level. Accounting managers need to weigh in the pros and cons of available AI tools in order to assess whether these will bring efficiency gains while at the same time not putting the entire team at risk due to privacy risks and data misuse.

Based on the existing academic literature on this topic, this research was able to successfully address some of the identified gaps, such as the problems of implementing AI systems in organizations, the lack of AI expertise to address some of the key issues around AI integration into accounting, and the issue of cultural resistance to technological advancement in the industry as a whole (Tiron-Tudor et al., 2022). Comparison of different perspectives of upstream and downstream processes in accounting provided enough incentive to involve even more stakeholders in future research.

What remains unexplored in this thesis are the insights of the stakeholder groups that are beyond those that are directly affected by AI integration into accounting. These could include not only regulators and government officials, but also creditors and suppliers who work closely with accounting departments on a daily basis. What also remains unexplored in this thesis is the comparison of different AI tools that are already in use in many companies. For instance, even though the interviewees discussed AI tools such as the company based chatbots, the research did not go a step further to discuss how these tools compare to the usual tools used in this function and what impact its use might have on accounting processes. This gap has likely emerged due to the fact that company-based chatbots are a recent invention, but future research should undoubtedly consider discussing this issue as well. Furthermore, the research did not consider many novel AI tools that are currently being increasingly adopted, such as prediction trackers and fraud detection tools. Future research could also investigate and compare these new tools.

Furthermore, the research gained insights from professionals working predominantly in the banking industry, mainly due to the convenience sampling strategy, as this was the most efficient strategy to find the potential research participants. Financial services are the industry with the most opportunities for accounting professionals and this strategy provides sufficient insight to draw parallels between experiences from different stakeholders. Nevertheless, future research should also consider other industries where accounting professionals are employed, including the governmental institutions and public sector. Since governmental institutions function quite differently from private businesses in many respects, it is very likely that the insights of accounting professionals employed in this field would differ from those of other industries. The public sector is generally characterized by inefficiencies and overall inertia, which makes it difficult to predict what impact the integration of AI will have on accounting professionals. Future research can not only examine specific industries, such as the public industry, but also draw comparisons between them.

Future research could also address the same topic and actors but use quantitative research methods instead. Some examples of methods that could be used are surveys and questionnaires that can focus on statistical relationships between different variables. An example would for the statistical relationship would be the potential relationship between familiarity with AI tools and the actual relevance of AI tools in the current position of a given research participants. Case studies in which accounting professionals test different AI tools to find the one that brings the most efficient gains could also be useful in future research.

6.3. Conclusion

According to the research participants, the main opportunities of AI integration into accounting include process optimization aspects, including improved efficiency, faster reporting cycles, real-time data analytics and big data management while at the same time automating operational and routine tasks. From the perspective of accounting professionals, AI integration will largely bring positive changes to the industry, such as improved work-life balance and shifting responsibilities, which will combine traditional roles with technological advancements.

According to stakeholders, among the biggest challenges of AI integration into accounting are the limitations of AI, especially limitations in terms of reliability and efficiency. This highlights the irreplaceable need for monitoring and human judgment in accounting processes in the future. The lack of structured training and guidelines for the use of AI is also perceived as a big issue by all three stakeholder groups. In terms of organizational aspects, one of the biggest obstacles to the integration of AI remains the conservative corporate culture in Austrian accounting industry. One of the main challenges which remains evident is ensuring data security and adhering to the corporate governance principles while at the same time not obstructing digital transformation initiatives and AI solutions.

AI tools will most likely reshape the function that accounting professionals play today, shifting their responsibilities towards a more IT-supported accounting profession. This will inevitably require constant learning and adaptation to new processes. According to stakeholders, the process towards a more AI-supported accounting profession should not be sudden, but rather gradual, in order to allow for the most successful outcome. Nevertheless, interpersonal skills will remain relevant even in an age of increasing technological pressure. As the effectiveness of AI solutions is perceived differently between different stakeholder groups, the compromise between established roles in accounting and AI integration into accounting will be difficult to achieve. Stakeholders agree that accounting professionals will not be replaced by AI developments, not even in the distant future. The most likely outcome of this transition will be a strong influence of AI on accounting processes. According to stakeholders, current concerns about job security are therefore completely exaggerated and should not be reflected in the real world. AI advances in accounting can only successfully address ethical and privacy concerns if the stakeholders involved are properly trained and given structured guidelines on data protection and security measures.

In terms of the research context and scope, both the general research objective of discussing the future of accounting where human and AI can complement each other, as well as the specific research objectives were fully considered. The answers to the proposed research questions were also clearly formulated. The significance of the thesis was expanded by investigating three additional research questions. The literature review covered all relevant academic literature, including topics such as the history of AI, the AI integration into accounting, op-

portunities and challenges, and theoretical frameworks, and identified gaps in the literature. The data analysis involved a detailed examination of the data collected in the semi-structured interviews. The findings of the interviewees were discussed in depth in order to paint a clear picture of the current issues related to the research topic. Future research directions and limitations of the research were also appropriately addressed.

From a personal perspective, there are still many unanswered questions. Will AI dominate the accounting industry in the future? Will AI take over the jobs of accountants? Frankly speaking, the future doesn't seem bright. Nevertheless, accountants need to confront these issues. And they need to start now.

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8. Appendices

Appendix A: Interview Guide

Interview Guide

- Prior to the interview:
  1. The interviewer's introduction, including their name, age, and current position
  2. Thank the interviewee for their time and ensure that the language used is appropriate for the respondent.
  3. A brief indication of the study's objectives—the research question itself is omitted.
  4. Describe the data's secrecy (brief topic introduction, transcription, recordings, etc.).
  5. “Do you agree to recording our conversation for analysis purposes? Your anonymity will be preserved, and no inferences about your personal identity will be possible. „
  6. “Before we proceed with the interview, do you have any questions you'd like to ask? If so, feel free to ask them now.”
- Interview Questions:

1. Block I – Personal and organizational information

1. “Can you briefly introduce yourself, including your first name and your current position within the organization?”
2. “How long have you been employed by this organization? How long have you been employed by your department?”
3. “In general, how is your business keeping up with current trends in digitalization?”

2. Block II (RQ 1) - Information on AI tools in accounting

1. “To what extent have you used AI tools in your workplace?”
2. “Please provide an example of this.”
3. “How would you assess your company’s willingness and capacity to invest its resources towards automation driven by AI?”
4. “What roles do AI tools play in your current position?”
5. “Please provide an example of this.”
6. “In your position, how much do AI tools improve accuracy over traditional methods?”
7. “In what ways have the AI tools been applied in order to successfully complete the day-to-day business in your current position?”
8. “In what ways have they been employed to complete strategic projects?”

3. Block II (RQ 2) - Opportunities and challenges to established roles

1. “Which, if any, work processes could be entirely or partially replaced by AI tools?“
2. “What impact does this have on the rest of your responsibilities?”
3. “To what extent do the skills and knowledge of an experienced accounting professional still matter to society, particularly in light of the increasing automation?”
4. “How can accounting professionals make the most of the AI tools?”
5. “Please provide an example of this.”
6. “How can accounting professionals profit from the efficiency gains generated by the AI tools?
7. “Please provide an example of this.”
8. “How do accounting professionals reassure their managers that AI tools cannot easily replace their position?”
9. “To what extent do you identify with the growing concern that AI tools may replace many job positions?”

4. Block III (RQ3) - Ethical and privacy concerns

1. “To what extent are you informed on potential threats AI tools can pose in accounting processes?”
2. “What are your main ethical and privacy concerns in regard to the AI adoption in your company and specifically in your position?”
3. “How can your company prevent employees from utilizing AI tools in unauthorized settings?”
4. “To what extent should accounting professionals rely on AI tools to extract data necessary for their projects?”
5. “How can the insights gained by the AI tools help compliance and monitoring efforts at your company?
6. “How do you see the future of accounting in regard to the AI automation processes?

- Following the interview:

1. Thank the interviewee for taking their time to participate in the research
2. Make sure to express willingness to provide the interviewee with a report on the study’s findings

Table 3. List of Abbreviations

AI	Artificial Intelligence
AIS	Accounting Information Systems
CFO	Chief Financial Officer
ChatGPT	Chat Generative Pre-Trained Transformer
DSS	Decision Support Systems
ERP	Enterprise Resource Planning
ES	Expert Systems
EU	European Union
EY	Ernst & Young
IBM	International Business Machines Corporation
ID	Identification
IT	Information Technology
ML	Machine Learning
NLP	Natural Language Processing
NN	Neural Networks
OCR	Optical Character Recognition
PC	Personal Computer
PWC	PricewaterhouseCoopers
RPA	Robotic Process Automation
RQ	Research Question
SAP	Systems, Applications and Productions in Data Processing
USD	US Dollar
WU	Wirtschaftsuniversität Wien
Windows XP	Windows Experience