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THE IMPACT OF ARTIFICIAL INTELLIGENCE SOFTWARE ON ACCOUNTING LABOR AND REVENUES

BY

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Abstract

This quantitative casual comparative study was conducted to determine the impact of Artificial Intelligence software on the future estimated accounting revenues (profits) and anticipated accounting labor force. The digital skills gap is becoming a more prevalent threat to the global workforce. Research has increasingly shown that Artificial Intelligence and its associated software are becoming a disruptive force within all areas of all industries, including the accounting industry. The study addressed three research questions that cover various aspects of this subject. The results of this quantitative research study supported the hypothesis that Artificial Intelligence software would significantly impact the accounting labor force and future accounting revenues. This research further extended existing studies on the accounting industry and its interactions with Artificial Intelligence. This study marked a change in the accounting industry landscape by tracking ideas regarding the impact of Artificial Intelligence on the accounting profession. It extended the research on the impact of Artificial Intelligence on society as a whole. The research demonstrated that the respondents viewed Artificial Intelligence software as a disruptive force in the accounting industry, and this new technology may be a force to be reckoned with in all industries for years to come. The hope is that this study will serve the interests of those in the accounting arena and move other researchers to delve deeper into how disruptive Artificial Intelligence technology is to the accounting industry.

INTRODUCTION

The increasing usage of Artificial Intelligence (AI) in various aspects of business such as marketing (Labib, 2024). There is a myriad of challenges (and opportunities) associated with the implementation and usage of AI in business that include the ethics involved (Diab & El Hajj, 2024), corporate social responsibility (Marino et al., 2023), and employee acceptance of AI tools (Choi, 2021). AI may harm the labor force while also creating increased revenues due to the increased efficiency created by the addition of Artificial Intelligence and the resulting changes in the duties of the accounting labor force due to the incorporation of Artificial Intelligence in the accounting process (Bakarich & O'Brien, 2021). Puhek (2025) notes the single largest risk of AI is turning over decision-making to it. The accounting profession involves a great deal of professional judgment. Relinquishing that to computer-generated decision-making is disconcerting to many.

The research herein differed from other research approaches because previous research focused explicitly on auditing or the accounting profession and education. This study took these studies further by focusing on the impact on the labor force and revenues (Baggio & Omana, 2019). This research may be a significant contribution because it will provide insight for accounting educators, students, and professionals into the effects of AI on future job outlook and profit and what skills need to be learned and adapted to remain valuable in the workplace resulting from the changes that have occurred due to the increased investment and adoption of Artificial Intelligence (Akanksha et al., 2022).

BACKGROUND AND PROBLEM STATEMENT

The background and problem statement presents the topic, describes the research problem, and highlights the study's significance (Ahmad et al., 2019). The background and problem statement sections set the stage for the research approach, detailed analysis, and the conclusions that will be found. The background and problem statement are also vital in ensuring the reader understands the relevant nature of the study and its beginnings in prior scholarly work, as well as its

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contribution to the academic discipline. Building this foundation is vital in moving the reader through the entire research process, from forming the concept to the details of the study implications and contributions to the current knowledge field.

The digital skills gap is one of the greatest threats to the global workforce—both in the accounting industry and corporate America (Douglass & Holmes, 2022). Research has shown that Artificial Intelligence has become a disruptive force within all business areas, including the accounting labor force. On average, participants were unsure whether they would fully understand AI but agreed that AI would change company culture. Whether AI will change company culture for good or bad remains to be seen. Opinions are still split over AI, with some accounting professionals saying that the overall effect of AI technology will be to vastly strengthen and enhance their abilities and handle repetitive tasks while not necessarily causing a workload reduction (Douglass & Holmes, 2022), while others operate in fear saying that, just like in Will Smith's movie "I Robot," AI technology will eventually replace the human workforce.

The most crucial evidence of AI's relevance to accounting was the adoption of technology by practicing accountants and auditors. Several leading firms have adopted cognitive technology in distinct phases (Davenport & Kokina, 2017). The role of AI in some accounting firms is still being developed (Baggio & Omana, 2019), while others have applied it to the production of audit processes. Some companies employed predictive and other analytics to examine and summarize entire populations of auditable entities like inventories rather than samples. While this technology is an essential precursor of cognitive technology, software tools are only considered cognitive or AI if they are autonomous and learn over time. The growing use of AI by the Big Four accounting corporations and cognitive technology led to this research (Davenport & Kokina, 2017; Douglass & Holmes, 2022).

The problem addressed in this study was the impact of Artificial Intelligence on current and future accounting professionals and revenues. The current body of literature is emerging and needs to adequately address the impact on the accounting industry from the educators' and accountants' perspectives, only the general views on the impact of AI. If further research is not conducted, the accounting community, both in the U.S. and abroad, will be left behind in accounting innovation and technology and may miss out on the overall benefits of adapting to this new way of doing business.

PURPOSE & SIGNIFICANCE OF STUDY

A quantitative research study can rely on scientific methods that produce numerical data and facts that are hard to dispute (Ahmad et al., 2019; Cordos & Tiron-Tudor, 2023). The approach that quantitative studies take begins with a specific theory or theories that eventually lead to particular hypotheses that need to be analyzed and evaluated according to established research procedures (Holton & Swanson, 2005). Quantitative studies reference a set of strategies, techniques, and assumptions used to study processes through the exploration of numeric patterns (Ahmad, et al., 2019). This research, also known as empirical research, can be accurately and precisely measured. Once the data is collected, it can either be divided into categories, put into rank, or measured in terms of the chosen units of measurement (Ahmad et al., 2019). With this information, the statistical relationships between the variables can be used to evaluate expressed influences and predict outcomes.

Social scientists use quantitative research to observe phenomena or occurrences affecting individuals. Social scientists are concerned with the study of people. Quantitative research is a way to learn about a particular group of people, known as a sample population (Ahmad et al., 2019). Research studies help test whether certain theories or hypotheses are valid; the result is that they support, refute, or refine the existing body of knowledge. At the end of the study, data is interpreted through the estimated relationship and the associated degree of certainty. As a result, quantitative data can help to see the big picture (Ahmad et al., 2019).

This research seeks to extend Ogundajo et al. (2023) that examined the effects of big data, blockchain, cloud accounting, and artificial intelligence on true cost accounting in the oil and gas sector in Nigeria. Big data, blockchain, and cloud accounting proved to have statistically significant effects while artificial intelligence did not. The current study aimed to determine the impact of the use of Artificial Intelligence on the anticipated future revenues of the accounting profession and the estimated future labor force of the accounting industry. This study benefits big and small accounting firms by helping them prepare for the future of the sector, the workforce, and accounting educators by assisting them in preparing all current accounting students for these anticipated changes in the industry. The study may also help practicing Certified Public Accountants (CPAs) and accounting individuals by anticipating new skills to pick up and adapt to the changing technological environment.

Significant research has the potential to challenge our understanding of the subject matter studied and paves the way for impressive research findings and advancements that benefit the whole of society. The purpose of this quantitative comparative research was to investigate if there was a statistically significant difference in the effect of Artificial Intelligence software on the anticipated future labor force. The study also examined the anticipated impact of AI on revenues of the accounting profession and the extent to which Artificial Intelligence software is a disruptive technology. Artificial Intelligence software may be prominent in the future of every industry, not just accounting. As the use of AI software increases, so does our need to understand the technology and its effects on every aspect of the accounting industry, from education to the workforce. The organizations that would benefit from this study are the Department of Labor, FICPA (Florida Institute of Certified Public Accountants), institutions of higher learning that prepare accounting students, and other accounting associations nationwide.

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HYPOTHESES

The general focus of the study was the impact of Artificial Intelligence on the labor force and revenues in the accounting industry. The research questions are based on a previous study by Douglass and Holmes in 2022 entitled "Artificial Intelligence: Reshaping the Accounting Profession and the Disruption to Accounting Education" and another study entitled "The Emergence of Artificial Intelligence: How AI is Changing Auditing" by Davenport and Kokina in 2017. Both studies were important sources because they focused on how Artificial Intelligence has become a disruptive technology throughout every profession, particularly the accounting profession. This research included the following main objectives: determining whether Artificial Intelligence impacted accounting revenues, the size of the accounting labor force, and the accounting work environment. To accomplish these goals, the study addressed the questions listed below. The null and alternate hypotheses are provided for each research question.

1. Is there a statistically significant difference that exists between present and future accounting revenues before and after the increased usage of Artificial Intelligence software?

$H_0$1. There is no difference in present and future revenues before and after the increased usage of AI software.

H_a1. There is a difference in present and future revenues before and after the increased usage of AI software.

2. Is there a statistically significant difference that exists between the sizes of the present and future accounting labor force after the increase in the use of Artificial Intelligence software?

$H_0$2. There is no difference in the sizes of the present and future accounting labor force after the increase in the use of Artificial Intelligence software.

H_a2. There is a difference in the sizes of the present and future accounting labor force after the increase in the use of Artificial Intelligence software.

3. Is there a statistically significant difference that exists between the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation?

$H_0$3. There is no difference in the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation.

H_a3. There is a difference in the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation.

Each one of the research questions was used to guide this research study. The three areas indicated as being affected by the increased use of Artificial Intelligence were the accounting revenues, the future size of the accounting labor force, and the landscape of the future work environment. The answers to these questions are presented subsequently in this article.

ARTIFICIAL INTELLIGENCE THEORY

Artificial Intelligence, or AI, is becoming the next big technology. In 2020, the statement was made that "[A]I is proving to be such a powerful technology that it is revolutionizing all aspects of our lives" (Denge, 2021, p. 3). This quote shows us the importance of Artificial Intelligence (AI). The growth of chatbots, machine learning, and other AI software is just the tip of the iceberg as it pertains to the growing impact of Artificial Intelligence in society today (Cordos & Tiron-Tudor, 2023). Many industries or job sectors are reevaluating their processes to maximize efficiency in a world that is moving towards increasing automation (Douglass & Holmes, 2022). These technologies have been very advantageous to the profession but also have some disadvantages concerning the future of the profession. Artificial Intelligence could eliminate human workers in the accounting arena (Jaiswal et al., 2022; Kolbjornsrud, 2024). For this reason, AI and its effect on areas of the world – particularly in the United States – must be studied.

The digital skills gap refers to the difference between the digital or computer-based skills that employers require and the skills that employees possess (Douglass & Holmes, 2022). As technology continues to evolve at the same rate or faster than today's technology, this gap has become a significant issue for many industries. This skills gap was also an opportunity for individuals, employers, and policymakers to work together to develop a more skilled and flexible workforce. Bridging this gap is necessary for economic growth, competitiveness in the industry, and making certain that the benefits of technological advancements are widely accessible. The digital skills gap is one of the most significant challenges that the workforce faces today (Douglass & Holmes, 2022).

Artificial Intelligence allows finance and accounting staff to increase their productivity and potential as strategic business partners (Baggio & Omana, 2019; Bakarich & O'Brien, 2021). Shifts like these can only occur if innovative ideas about education and post-graduate education occur. The advancement of AI has outpaced these shifts in mindsets, as they have gradually changed in the professional arena (Douglass & Holmes, 2022). External regulators are acting reactively regarding the growth of AI technology as corporations deal with an increasingly higher degree of demand to provide controls for the AI systems they use. (Akanksha et al., 2022; Baggio & Omana, 2019) In November 2020, The Office of Management and Budget first guided the United States in regulating AI applications (Douglass & Holmes, 2022). Knowing this, the primary burden will be placed on the first organizations to use AI systems. These businesses will need the expertise to determine that their AI systems produce accurate and reliable reports.

The population examined for this study was accountants in the United States. The approximate size of the accounting profession was expected to grow at a rate of 6% to 1,531,600 by 2031 (Bureau of Labor Statistics, 2023). The initial burden of AI risk was assumed to fall on the organizations that use them. Ensuring their AI systems produce reliable and accurate

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reports requires human interaction, which is the same resource that AI technology was designed to limit or replace (Douglass & Holmes, 2022).

The theories associated with human resources theory are systems, psychological, and economic theories. These three theories combined to provide the necessary basis for human resources theory and for proving the significance of the problem statement. Systems theory deals with the complex and robust interactions of environments, organizations, work processes, and the variable(s) operating at any time and over a specified period (Swanson, 2001). Systems theory represents the environment created by Artificial Intelligence and its interaction with the human in charge (Swanson, 2001). Another theory is psychological theory, which took the characteristics of the socio-technical interactions between humans and systems. The AI interactions between humans and technology were studied here. Finally, economic theory encompassed the primary issues of the effective and efficient utilization of resources to meet goals in a competitive environment (Swanson, 2001). The implications of economic theory may drive decisions as companies race to get the most recent technological advances and increase efficiencies by reducing human resources and replacing them with these technological advances.

A good theory is thorough, and its concepts have been assessed intellectually and in practice (Swanson, 2001). Human resources theory was one of those theories. Human resources theory describes interactions between humans and Artificial Intelligence on several diverse levels (Swanson, 2001). Human resources theory is a theory that consists of multiple theories, and researchers must understand that building that theory is an educational process. Theory building is the cycle of the system of ideas through which sound descriptions, explanations, and representations of observed or experienced events are generated, verified, and refined (Swanson, 2001). Establishing and maintaining theory building always continues, regardless of the discipline. Human resources theory and its components apply to most academic fields like medicine, engineering, education, business, and communication. These components draw upon multiple theories to articulate the foundation of each discipline (Denge, 2021).

Human resources theory and its components are committed to learning and helping people and organizations improve performance (Swanson, 2001). Accounting is one discipline that draws upon human resources theory and its components. The first of these theories is systems theory. Systems theory focuses on understanding the system and its potential to improve functions and operations (Jacobs, 2014). Artificial Intelligence is one of the ways to potentially improve the accounting system.

Therefore, companies are made of humans and need human expertise to perform, grow and adapt. They must grow in areas that include everything from assuring continued viable financial growth of the organization to satisfying every customer seeking its services (Akanksha et al., 2022; Damerji & Salimi, 2021). The description above is the core quality of human resource theory, which aims to grow, develop, and unleash human expertise to improve the organization's performance (Swanson, 2001).

The three theories that combine to equal the human resources theory are systems theory, psychological theory, and economic theory (Swanson, 2001). When studied individually, systems, psychological, and economic theories must be adapted to produce sustainable results. These theories related to the research problem of this study for several reasons. Systems theory captures the complex interactions of different environments and organizations to work processes and group/individual variables operating at any period and over time. The specific interaction systems theory references in this problem are the relationship between new Artificial Intelligence software processes, their interaction with human subjects, and how it affects the current human-led accounting environment (Kolbjornsrud, 2024). One key question arising from this work is whether AI will cause human employees to pivot so they will not lose their positions in accounting firms.

Next, psychological theory breaks down and clarifies the goals and development of individuals, leaders of organizations, and work process managers. These concepts are important for understanding how human systems change as Artificial Intelligence is integrated into these systems or organizations. Finally, the principles of economic theory center around managing scarce resources and wealth accumulation. In this research study, economic theory may predict how the introduction of Artificial Intelligence software may affect both the profit margins and employment as the new technology is adopted. The components may contribute to understanding the potential impact of AI software on human resources theory (Swanson, 2001).

Systems theory looks at organizations as complex interwoven parts that interact with themselves and the surrounding environment. Systems theory has been applied to many different industries, including business management and accounting. Systems theory focuses on the importance of focusing on both the individual components of the system and the entire system as a whole (Swanson, 2001). System theory shows that some interactions between parts can produce unpredictable results that cannot be predicted by analyzing each individual item.

Systems theory, as related to accounting, also highlights how financial transactions connect by reporting the procedures and decision-making processes within a corporate environment. It also shows how external factors like advances in technology, changes in laws, or economic conditions impact the accounting system (Swanson, 2001). The benefits of adopting AI tools for accounting include better decision-making, improvements in adaptability and efficiency, and better knowledge and understanding of the financial health of the company and how it relates to the surrounding external environment. By viewing accounting as a unified system, companies can more effectively align their financial procedures with their strategic goals, create and maintain

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continuous value, and respond to changes in their surrounding environment.

Systems theory deals with the complex and robust interactions of environments, organizations, work processes, and the variable(s) operating at any time and over a specified period (Swanson, 2001). Systems theory aims to explain things, natural or artificial, as part of systems and the interaction of their respective parts regarding the interaction of Artificial Intelligence and human-run systems. A fundamental requirement of systems theory is that it is based on a social system or subsystem like organizations, roles, institutions, and everyday activities. System theory has contributed to understanding human resources theory as much or more than any other foundational theory or body of knowledge (Jacobs, 2014). Due to the growing importance and influence of systems theory and technology, it would be prudent to include this in a study of human resources theory (Jacobs, 2014).

The main framework of a research study that showed the relationships among variables is an example of a conceptual system. It seems reasonable to restrict the discussion to artificial systems that have been purposely designed. A system may be discussed while in its current observable state and may be represented in an ideal or future state that has not yet come to fruition (Jacobs, 2014). The difference between current and ideal systems constitutes much of the planning process across disciplines.

A system consists of various parts or elements, with each part having unique characteristics; the components have relationships and interact; and, finally, the system has an environment where the parts function as a whole. From this perspective, all objects, events, or combinations of actions or component interactions are considered systems. To explain in simple terms, everything possible is, in fact, a system (Jacobs, 2014).

A system comprises a set of inputs, processes, outputs, and feedback. To state briefly, inputs are the various elements that a system uses as resources from which to achieve its goals. The goal, or the reason for the existence of the system, is an important type of input because it focuses, energizes, and differentiates one system from another. Resources utilized in the system, like money, materials, facilities, people, and information, also form essential sets of inputs.

Processes are the different activities that a system undertakes to use those inputs to achieve the planned goals. These processes include human actions, machine actions using technology, or a combination of human and machine actions. The outputs are the results, both planned and not deliberate, that occur from these associated processes. The achievement of those outputs may happen due to different approaches. This description helps explain system theory as it relates to using AI in the accounting industry.

Systems comprise subsystems, and the interaction among these subsystems often results in consistent change. A system state defines a system's features at any given time (Jacobs, 2014). Technology shifts cause us to question how they affect the work and perception of human resource theory and its systems theory component in organizations (Ellmer & Reichel, 2021). When this system includes a combination of Artificial Intelligence and humans, it denotes the more recent renderings of human resource theory and its systems theory component.

Psychological theory can be applied to Artificial Intelligence in the same way it can be compared to a fully human environment (Denge, 2021). Psychological theory takes the characteristics of the socio-technical interactions between humans and systems (Swanson, 2001). A highly competitive psychological environment sometimes causes behavioral changes due to individuals acting more manipulatively and harshly and hiding information to make their work environments more beneficial to themselves and attain more power in the work environment (Irangani et al., 2021).

The interaction of psychological theory and accounting investigates how human behavior, emotions, and thought processes influence accounting procedures, decision-making, and financial reporting (Bakarich & O'Brien, 2021). This approach gives insight into the psychological factors that play into the financial decisions of individuals, auditors, managers, and investors (Dillard, 2000). By viewing psychological theories from the accounting perspective, one can better understand and predict the behaviors that influence decision-making and reporting processes related to finances. This approach assists with the accuracy and reliability of financial information and contributes to developing more effective financial policies and procedures.

The same types of manipulation and propensity to hide information exist in environments with Artificial Intelligence (Bankins & Formosa, 2023). The desire to gain more power and the fear of losing jobs to AI causes human employees to attempt to determine ways to keep their status in the organization. In the competitive psychological climate, employees who think about self-identity believe that their goal attainment has to be better than humans and AI (Irangani et al., 2021). From the competitive approach, employees would like themselves to be the winners and other co-workers and AI bots to be less successful.

Competition causes employees to continually compare their movement and progress to other team members and Artificial Intelligence software. It produces a desire to be the best person in the team between human employees and AI software (Irangani et al., 2021). As a result, employees frequently tend to outwork others to fulfill their desires with inner motivation to achieve their goals by attempting to highlight their advantages by challenging other teams in competitive situations (Berente et al., 2021; Dirican, 2015). Sometimes, their construal level triggers them to take charge, especially if they have become well-versed in the intricacies of the usage of AI software; they will withhold information as a form of job security.

Economic theory includes a wide range of concepts that explain how the economy operates, how economic professionals make decisions, and how resources are assigned

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and allotted (Denge, 2021; Douglass & Holmes, 2022). It provides a foundation for understanding market interactions, the behavior of customers and companies, and economic policy outcomes. Opportunity cost is the main idea in economics that references the value of the best alternative missed during the decision-making process (Caceres-Santamaria, 2019). It casts a light on the scarcity principle and the need for considering trade-offs when decision-making. The term efficiency, as related to economic theory, is an analysis done in terms of dispersing resources in a way that maximizes goods and services production. As related to economic theory, efficiency is concerned with making the best use of scarce resources.

Economic theory is important for efficiently allocating resources, estimating economic trends, developing policies, and addressing economic issues like inflation, poverty, and unemployment. Economic theory provides an organized way to analyze real-time economic issues and estimate the consequences of economic policies and events. It is important to note that economic theories sometimes rely on assumptions that might not hold in the world around us, and these limitations encourage new theory development and continuous debates (Dirican, 2015; Fava, 2023).

Economic theory consists of the primary issues of the effective and efficient utilization of resources to meet its goals in a competitive environment. Economic theory is recognized as more companies race to get the most recent technological advances and try to increase efficiencies by reducing human resources and replacing them with these technological advances (Spencer, 1994; Swanson, 2001). Cost accounting and opportunity costs as part of economics are distinct but closely related (Caceres-Santamaria, 2019). Cost accounting focuses on capturing all production costs to make pricing and inventory decisions. Economic theory adds to this by considering opportunity costs. By merging economic cost concepts into accounting principles, researchers can develop a more detailed view of the benefits and costs associated with different business decisions and strategies. Economic theory and accounting interact with one another to contribute valuable insights and foundations that assist with understanding financial decision-making and the broader economic thinking behind why those decisions were made (Caceres-Santamaria, 2019).

Human resources and accounting are two separate entities connected through the subject of business management (Swanson, 2001). The connection between human resources theory and accounting can be shown in several ways. Most human resource management decisions have a financial impact. A large part of a company’s budget includes recruitment and training costs, employee compensation, and benefits, which are all functions of human resource management. Accounting tools help analyze these costs to assess their impact on the corporation so managers can make informed decisions (Kabst & Weber, 2004). As part of human resource management, performance management systems rely on financial markers to measure employee productivity and contributions to corporate goals (Akanksha et al., 2022).

Strategic human resource management and theory means aligning human resources practices with the company's strategic objectives. These objectives often have financial consequences. Cost-benefit analysis, financial reporting metrics, and other accounting information are essential for evaluating the effectiveness of human resource strategies and practices in achieving their goals (Denge, 2021). In closing, merging human resources and accounting practices is important for achieving corporate effectiveness and efficiency and maintaining a competitive advantage.

Artificial Intelligence and its first usage in accounting can be traced back to almost thirty years ago (Petkov, 2020). For example, it was first utilized in organizations to prepare financial statements. These examples of specific tasks could be delegated today and moved forward to Artificial Intelligence. The research on using Artificial Intelligence software in accounting, particularly for financial accounting applications such as auditing, began in the late 1980s to early 1990s (Almezeini & Almufadda, 2022). Before that, during the 20th century, there were rapid developments of Artificial Intelligence software in other areas. The initial use of AI was called the Turing Test in the mid-1950s—a test whose purpose was to trick people into believing that the machine was human (Petkov, 2020). Shortly after this, General Motors began to use Artificial Intelligence to replace some of their human functions on the assembly lines in their plants.

The history of the development of Artificial Intelligence has progressed through several stages. Initially, AI focused on problem-solving; ironically, this neglected the importance of the knowledge and expertise required to solve problems and provide solutions (Almezeini & Almufadda, 2022). In the late 1960s and 1970s, AI research was increasingly applied to practical uses like disease diagnosis and treatment. In the 1980s, AI was launched into the open market, and people began recognizing its value. In Japan, in 1982, a program known as the fifth-generation computer development program was birthed to allow the speed of computer reasoning applications to approach the speed of computer numerical calculations (Almezeini & Almufadda, 2022). The outcome of the failed experiment led to a boom in AI research in the global marketplace (Baggio & Omana, 2019).

The introduction of the internet changed the game in the 1990s, and AI began being instituted in a web-based environment. Currently, in the 21st century, the initiation of computer technology has caused people to become more interested in the AI technologies of voice and text recognition (Almezeini & Almufadda, 2022). Today, AI technology is defined as the ability of computer systems to do tasks that generally require biological or human intelligence with functions like perception, recognition, decision-making, and control (Akanksha et al., 2022). Artificial Intelligence technologies include expert systems, natural language processing (NLP), artificial neural networks (ANNs), machine learning (ML), and deep learning (Bakarich & O'Brien, 2021).

There have been periods that vary between rapid and slowdowns in growth, but the shifts have been moving toward

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developing this AI technology. Artificial Intelligence in the accounting industry has been around and successfully used in many areas of financial reporting. Research has shown that many areas have seen significant developments and attempts at implementing technology in accounting. In one example, Cisco developed a "virtual closing" process in 2001 (Petkov, 2020), and it leveraged simple AI/Analytics techniques. This process aims to “close the books and be able to generate consolidated financial statements at any point in time” (Petkov, 2020, p. 99). Closing the books would allow for continuous monitoring and on-time decision-making by the project managers.

Machine learning, which consists of computer algorithms that aid decision processes by finding patterns in the given data, improved fraud detection (Douglass & Holmes, 2022). This trait has been a disruptive feature, changing how accountants manage inventory, search engine result rankings, healthcare, and other services dealing with large data amounts (Bakarich & O'Brien, 2021). AI and machine learning methods are utilized in the insurance industry to assess credit quality and automate client interactions to value and market insurance contracts (Douglass & Holmes, 2022). Finally, AI and machine learning are being developed to assist with month-end and year-end financial statements during the closeout process (Baggio & Omana, 2019).

Humans perform most of the accounting functions. For example, humans recognize economic events and correctly record them in journal entries according to the established U.S. GAAP or IFRS criteria (Petkov, 2020). Economic events usually involve exchanging goods or services for money. The accountants' job is to find these events and record them in journal entries on the trial balances for their respective organizations (Bakarich & O'Brien, 2021). With the constantly changing environments and the introduction of AI in many aspects of our society, it is natural to rethink the base accounting functions and determine potential accounting processes that could benefit from AI.

Adding specific examples of areas or tasks that could be accomplished through Artificial Intelligence is essential (Dirican, 2015; Sudaryanto et al., 2023). These examples would further help organizations incorporate AI technology into their accounting routines (Petkov, 2020). Artificial Intelligence describes the theory and development of computational methods to perform tasks that typically require human intellect. Examples of Artificial Intelligence applications include visual perception, speech recognition, decision-making, and translation between languages. In other words, AI is a system that can perform accounting tasks that generally require human intelligence (Bakarich & O'Brien, 2021). Accounting tasks often refer to the ability of AI to analyze historical data and to use that data to make decisions or judgments for estimates. AI has undergone a series of improvements that allow it to be more aware of its surroundings and make logical connections based on historical and operational inputs.

One example of how AI could cause changes in the Accounting Industry is tax planning. An offshoot of Artificial Intelligence called generative AI technology can create everything from conversational text, creative images, programming code, and more. Other types of Artificial Intelligence, such as machine learning, have shown the ability to make predictions based on existing data. Generative AI, however, takes this ability a step further by creating new works with the same information as the training set or data inputs, which include text, images, programming code, and more (Fava, 2023).

The introduction and adoption of AI calls for employees to enhance their skills or to gain more knowledge about how to take advantage of or effectively use the developing technologies (Akanksha et al., 2022). The impact of this need for upskilling will be that AI technology will create new jobs with “value creation” (Akanksha et al., 2022, p. 1179). In the next decade, this new AI technology will change how businesses work for the foreseeable future. AI will change how business works because this new technology senses, comprehends, learns, and acts based on human inputs. The eventual displacement of labor and disruption to the workforce has already begun as most companies, including accounting companies, adopt this new technology based on Artificial Intelligence (Akanksha et al., 2022). AI is becoming more commonplace in developing nations such as China and India. In China, 77% of the workforce has employed AI in their work in some shape or form, while this number is 71% in India (Akanksha et al., 2022). AI technology works with humans and improves decision-making processes. This improved decision-making also improves everyone's quality of life (Akanksha et al., 2022). As a result, many large companies or conglomerates are heavily involved with knowledge-based AI tools that contain large amounts of information.

The models created by generative AI help plan designers with tasks that require the development of innovative ideas, forecasting future scenarios, and the modeling of more complex processes. Generative AI can be applied to many industries, from creating new distinct art pieces to the recreation and modeling of molecular structures in science (Fava, 2023). The financial sector utilizes generative AI to create trading algorithms for risk management and uncovering fraud. As a result of generative AI, Goldman Sachs experimented with using this technology to classify and categorize documents. Also, JPMorgan used the technology to create its own ChatGPT-like software to aid in selecting customer investment plans (Fava, 2023).

Artificial Intelligence (AI) has been a transformative force across various industries. The first advantage of Artificial Intelligence is that it processes and analyzes data faster than humans. This processing speed increases productivity and quicker decision-making for the company (Bakarich & O'Brien, 2021). AI systems can operate twenty-four hours a day and seven days a week without getting tired. This makes for constant operation and monitoring, a characteristic that is beneficial in the areas of healthcare and customer service. In

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addition, by relying on predetermined conditions and created algorithms, AI can reduce occurrences of human errors (Bakarich & O'Brien, 2021).

Artificial Intelligence excels at automating routine and repeating tasks, providing the advantage of allowing humans to engage in more complicated and innovative activities (Varzaru et al., 2022). Next, because AI can comb through substantial amounts of data more quickly, patterns and understandings that might be missed by humans can be discovered. This depth of analysis aids in researching and developing marketing strategies and many other complex decisions (Sudaryanto et al., 2023; Varzaru et al., 2022). Chatbots and other AI software solutions can improve the customer's experience by delivering quick, quality responses and tailored services.

AI technologies also have some notable disadvantages. While AI offers significant benefits that can take efficiency, decision-making, and innovation to another level, it also poses challenges related to job displacement, ethical concerns, and the potential for bias. Balancing these advantages and disadvantages is necessary for leveraging AI effectively and ethically. As the use of AI becomes more prevalent in the use of both routine and multilayered activities, there is a concern that jobs may be eliminated (Akanksha et al., 2022; Almezeini & Almufadda, 2022). This would require either increased unemployment assistance or the need for workers to develop a new skillset or some type of job training opportunities in all sectors (Akanksha et al., 2022). Another disadvantage is that the design, development, and implementation of Artificial Intelligence systems are expensive. This would make it more difficult for smaller companies to adopt new and emerging AI technologies. Another characteristic differentiating AI from human task handling is creativity. AI can only make decisions based on the data and commands with which they are programmed. In other words, AI does not think creatively, and it just provides cookie-cutter decision-making based on previously known information.

Some additional disadvantages of Artificial Intelligence are the ethical and privacy implications (Cordos & Tiron-Tudor, 2023). Using AI raises questions about user privacy, surveillance, and ethical data usage. These issues come into play in particular with systems that learn and evolve over time (Bankins & Formosa, 2023). What happens when you are too reliant on Artificial Intelligence? This question leads us to another disadvantage due to potential over-reliance on AI that could lead to a loss of simple decision-making skills or a diminishing of human intellectual reasoning abilities. The final disadvantage is in the area of bias (Bankins & Formosa, 2023). Whatever is input is what will be output; if AI systems are trained by biased data, they will continue to magnify these biases, leading to unfair and possible discriminatory outcomes.

Mark Sanborn once said that success in life is based on your ability to change faster than your competition, customers, and business. Progress requires change. Change leads to progress. Change is inevitable. There is a measure of unwillingness to make this cultural shift toward using Artificial Intelligence (Petkov, 2020; Varzaru et al., 2022). As with any changes, integrating AI into an established profession like accounting may result in both direct benefits to its workers and would also come with disadvantages. Others have concluded that the benefits of AI implementation far outweigh the costs (Petkov, 2020). As a result, to see any movement toward AI in the financial reporting arena, there needs to be some group of companies moving toward these goals combined with political muscle. This political muscle needs to implement policies to mandate the new standards. As we note, many players participate in this process, and all need to transition toward a new system integrating Artificial Intelligence.

Can Artificial Intelligence affect events with national and international consequences or implications like elections? The influence of AI on election results is an extremely complicated issue that continues to be studied and is an item of current concern. AI can play many roles in the context of elections. These roles can impact both the integrity of the election process and the way campaigns are facilitated. Campaigns can utilize AI to create an analysis of substantial amounts of data to identify prospective voters and create messages that relate to individual preferences and concerns. This has the potential to increase voter engagement and turnout to support specific candidates. More prevalent now is social media misinformation. This spread of false information on social media platforms can influence voter perceptions and opinions.

Computer generated bots can strengthen different narratives or fake news, having a dramatic impact on public opinion and possibly sway voters and election results. AI can play two sides of the coin by providing protection from security threats or posing a security threat to the electronic electoral systems software. Very elaborate Artificial Intelligence tools can be used to hack or tamper with electronic voting systems, voter databases, and electronic counting of votes. On the other side, AI can also be deployed to strengthen the security of the election systems software against these attacks.

Another way that Artificial Intelligence affects elections is through the analysis of public sentiment towards different candidates or issues on social media and other platforms like X (formerly known as Twitter), Facebook, Instagram, TikTok, and Threads. This information is important for those campaigns that are interested in adjusting their strategies instantaneously; however, it continues to raise concerns about voter privacy and the manipulation of the public or free speech. Another issue of greater occurrence today is AI-generated deepfakes (fake video or audio recordings) that are so realistic that they are being used to create false narratives or impersonate politicians to mislead voters, which could influence election results. While Artificial Intelligence does have the potential to improve the democratic process, it also poses a significant challenge to ethical outcomes. It is for this reason that all videos, audio, and written statements should go through a verification process. AI could improve the accuracy of voter registration and the efficiency of vote counting; but it can also be used for negative activities that can influence the

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election as well. The ethical implications for the use of AI in elections require large legal foundations, transparency amongst all parties involved, and accountability measures to make sure that this technology strengthens rather than weakens the democratic process in the US and beyond.

The primary goal is to provide enough input into AI in the accounting function to begin to learn actively from the establishment's operations (Kolbjornsrud, 2024). Meeting this goal would allow Artificial Intelligence to sort, identify, and process facts and use this data to make decisions and estimates using accounting principles (Petkov, 2020). As the capacity for cognitive development increases with time, AI benefits humans by giving them the ability to think and gain an understanding of experiences through learning from given parameters and habits. This learning ability allows AI to form credible intelligence and adequately process information. These users include the company's accountants and external auditors. Their responsibilities and functions would change due to the introduction of AI to accounting and auditing processes (Akanksha et al., 2022; Bakarich & O'Brien, 2021). The expectation is that accounting tasks will gradually change to monitoring. Auditors would also need to regroup and reassess their risk assessment model and testing processes related to the accounting process's steps. It is not that the technology is new, and people are just learning about it, but it is disruptive to the accounting arena. This tech could benefit accounting/auditing professionals if they seek to understand it better. Instead, based on the research, implementing Artificial Intelligence into the accounting function has many benefits. Huang (2018) notes that tax auditing professionals have gained new analytical and statistical tools from AI that improve efficiency and are more convenient. From a historical perspective, though, there have yet to be any measures introduced to shift toward a more automated accounting function (Petkov, 2020).

The final impact mentioned here is the effect of Artificial Intelligence on the necessary time to prepare the financial statements for a company. When humans prepare financial statements, the results are not instant – it takes time for individuals to produce estimates (Akanksha et al., 2022). This time delay could range from days to weeks. There is a break in the recorded economic events and their actual reporting to interested users over an established period. In a fast-paced economy, if reporting financial results is delayed, it could be detrimental to the business (Petkov, 2020).

The benefits of introducing AI into accounting tasks can be either for internal or external purposes. AI facilitates and allows organizations to provide more timely and accurate financial statements for internal purposes. This increase in timeliness and accuracy is due to AI's nature and ability to analyze and interpret information on a much faster scale than people (Akanksha et al., 2022; Baggio & Omana, 2019). This outcome may apply to any tasks or analyses AI performs, resulting in almost immediate outputs. This would ensure more considerable improvements in the timeliness of the information. For accuracy, if Artificial Intelligence is programmed to apply principles as they emerge, the output would be potentially more accurate and consistent.

Sometimes, humans may operate irrationally or with impure motives. For this reason, Artificial Intelligence should be created with limits—upper and lower restrictions under which the machine could exercise judgment. By empowering Artificial Intelligence to enter the accounting function, software developers may be able to minimize human mistakes, which is another benefit. In general, people make subjective interpretations of rules and regulations, even in the accounting function (Baggio & Omana, 2019; Bakarich & O'Brien, 2021). We should see improvement by delegating or substituting some tasks to AI and applying proper rules or guidelines regarding how Artificial Intelligence should perform the transactions. If many organizations apply AI with predefined principles, there will be a certain uniformity across agencies for financial reporting. The audit function would mainly evaluate AI to ensure compliance with the rules and that owners' tampering does not occur. To some extent, this audit function would help reduce opportunities for the human function to commit fraud, which is another benefit or advantage (Bakarich & O'Brien, 2021). Fraud will not be eliminated as change occurs; people will pivot to find other ways to take unfair advantage. However, the currently observed fraudulent activities would reduce significantly as the current opportunities would be eliminated (Petkov, 2020).

The most significant impact of implementing AI into the accounting workforce may be reducing costs in the long term. Reducing reliance on people to perform specific tasks explains one important source of cost reductions. The initial fixed cost that needs to be paid to cover the creation, planning, and implementation might be high (a disadvantage), but it would balance out over the long term. The ensuing costs would be mainly associated with monitoring and reviewing the work done by Artificial Intelligence (Bankins & Formosa, 2023; Dirican, 2015). The significant costs associated with AI would be maintaining and constantly improving the AI process and decision-making over time. In addition, another budget buster would be based on the total dependence on an AI system. If this system is attacked, and there is no backup based on human involvement, it might become more of a liability than an asset. This risk brings us to the critical conclusion that AI needs to be appropriately monitored and maintained.

In the article "Meeting the Challenge of Artificial Intelligence," Alan Turing, considered by many as the father of AI, authored a paper that asked, "Can machines think," and explained how to build intelligent machines (Hazelbaker & Lin, 2019, p. 49). “Artificial Intelligence” was a term first used by John McCarthy and described as “the science and engineering of making intelligent machines” (Hazelbaker & Lin, 2019, p. 49). Funding for research and scientific interest waned when the computers at that time could not store enough data points or were too slow to process them to be considered as showing intelligence (Almufadda & Almezeini, 2022). In the 1980s, AI research was reestablished due to the emergence of new development tools and increased funding. As a result,

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business-related AI projects abundantly used these new tools and technologies. The algorithms produced models generated from existing data to perform specific tasks. This training sample can be used to predict or make decisions without human programming (Hazelbaker & Lin, 2019). In the '80s and '90s, according to Hazelbaker & Lin (2019), 167 studies were conducted on five areas of accounting: auditing, taxation, financial accounting, personal financial planning, and management accounting. The discussion around disruptive technologies in accounting began in 2018, with a small percentage of articles (2.6%) and peaked at 33.3% in 2022 (Cordos & Tiron-Tudor, 2023). Technology's influence in accounting is very recent, it peaked in recent years and had little presence within the literature before 2020 (Cordos & Tiron-Tudor, 2023). These findings are in line with the newness of the subject and the increased focus that has been garnered in recent publications.

As recently as the twenty-first century, Artificial Intelligence has become more mainstream. Some drawbacks may occur due to an individual's expectations, experiences, and preferences (Hazelbaker & Lin, 2019). The Big Four accounting firms (Deloitte, PricewaterhouseCoopers (PwC), Ernst & Young (EY), and KPMG) have spent time developing AI-driven tools. These tools have also benefited smaller, less-known companies (Hazelbaker & Lin, 2019). This technology has helped companies like Gursey and Schneider LLP to use these AI audit tools to gather enough information and evidence from their own client data to proceed with a $2.8 million criminal fraud case (Hazelbaker & Lin, 2019). Artificial Intelligence was seen as giving companies the wherewithal to make large data sets and turn them into manageable chunks of information by taking all the data, making decisions based on that data, and determining relationships between those items (Varzaru et al., 2022). This ability has caused more companies to consistently view Artificial Intelligence as a viable option for their businesses.

In an article about Artificial Intelligence, critics stated the following belief, "Our education system is doing a dismal job of preparing accountants to work deeply with technology" (Douglass & Holmes, 2022, p. 55). Accountants can defy this belief by transforming it into a competitive advantage related to their financial background (Baggio & Omana, 2019; Douglass & Holmes, 2022). There is a widespread view that integrating data management and AI into accounting curricula will more than adequately prepare the next generation of accountants. Accounting students should also be taught computer programming skills to understand how AI works, correctly sequence tasks, and create clear problem-solving parameters, taking their abilities to the next level (Sudaryanto et al., 2023; Varzaru et al., 2022). It is believed that the impact of recent technology has produced the most notable change in the profession since the creation of the Securities Exchange Commission. There is also a shared belief that regardless of the discipline (audit, accounting, tax, consulting), all fields will be affected by this innovation (Cordos & Tiron-Tudor, 2023; Moudud-Ul-Huq, 2014). The effects of these innovative ideas will have to be assessed, and a niche will be developed using this modern technology. CPA firm leaders should continuously share their vision and implementation plans with the staff.

Fuzzy logic is another part of Artificial Intelligence that has had an impact on the accounting industry. Fuzzy logic is a part of AI that deals with the process of human reasoning. The Artificial Intelligence software actually mimics the human decision-making process (Emetaram & Uchime, 2021). The decisions made using fuzzy logic are actually partial truths that range somewhere between a completely false idea and a completely true idea. The fuzzy set theory that fuzzy logic is based on is a simplification of classical set theory. Classical set theory classifies an element as a member of the set or not a member of the set (Emetaram & Uchime, 2021). For all intents and purposes, the use of fuzzy logic is applicable to both practical and commercial purposes. Fuzzy logic controls machines and gives acceptable results despite its reasoning being inaccurate at times (Emetaram & Uchime, 2021).

Tools such as logic-based programming, robotic process automation, expert systems, and descriptive and predictive analytics are helping businesses to transform the workplace rapidly (Akanksha et al., 2022). Robotic process automation (RPA) involves the use of human programmers to design a software robot to use existing apps to communicate with other systems, perform commands, and manipulate data (Bakarich & O'Brien, 2021). RPA is a form of technology that schedules rule-based and monotonous activities using a script. Over the last twenty years, RPA has become more popular because software robots are easier to program or train. RPA programs perform rule-based, high-volume repeating activities by imitating human actions when accessing more than one system, application, or document (Emetaram & Uchime, 2021). These software robots can operate the same way humans do in the program, reducing the need to modify application processes (i.e., accounting and payroll) or the main IT infrastructure. The robot's activities are tracked to meet audit requirements and to maintain data integrity. Some of the business administration tasks that RPA can complete include reading and sending emails; searching, updating, and extracting information; and data entry across multiple applications or software programs (Emetaram & Uchime, 2021).

A human element is required to manually input data to be processed since robots are unable to process unstructured information. Many existing tasks cannot be automated with the present RPA technology because cognitive tasks require modeling based on staff experiences (Bakarich & O'Brien, 2021; Emetaram & Uchime, 2021). AI and RPA tools cannot replace each other but they can be used either separately or together and actually increase the value of each other (Douglass & Holmes, 2022; Emetaram & Uchime, 2021). AI and RPA are two close but different technologies that continue to have a significant impact on the automation of auditing and accounting practices in the industry. As automation is quickly evolving to a more data-driven approach from a process-driven approach, AI and RPA are on two opposing sides of the automation field (Emetaram &

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Uchime, 2021). RPA handles processes like internal performance reporting, purchase-to-pay, and record-to-report; routine processes that do not require making complex decisions or judgments. Robots are projected to replace humans in manual bookkeeping and assist them with multidimensional, complex processes (Emetaram & Uchime, 2021). Many accounting procedures could benefit from being automated.

The most developed part of Artificial Intelligence used in the accounting industry is the continued development and use of expert systems. Expert systems were developed to advise accountants on a number of issues. Accountants who monitor, understand, and know how to improve cognitive and analytical procedures and processes will benefit from expert systems, while those who purposefully avoid the old ways of accounting will not.

With the advancement of expert systems and data process automation, direct access to current information has been made available for all businesses. These advances enable more informed decision-making and allow accountants to easily determine things that affect the profitability and performance of the business in real time (Emetaram & Uchime, 2021). Application of expert systems in accounting occurs in the following categories: financial accounting, taxation, auditing, management accounting, and personal financial planning (Damerji & Salimi, 2021). Accountants will be able to improve the quality of their provided services because expert systems integrate the knowledge of multiple human experts in the areas of internal controls and identification and evaluation of audit risks and planning (Emetaram & Uchime, 2021). Expert systems can be utilized in auditing for verification and screening of transactions, determining fraud, and processing and authorizing claims. AI can also be used in several functions of financial accounting in terms of cash flow.

Many significant changes will occur in the accounting industry as a result of automation with both RPA and AI. Routine, repetitive tasks normally done by entry-level staff will be replaced by robots and other software, while more seasoned employees will be needed to make high-level decisions that require more judgment (Bakarich & O'Brien, 2021; Cordos & Tiron-Tudor, 2023). The accounting profession has been evolving just as other industries in the information age. Most businesses are proactively shifting records management from paper-based to automation, giving them a competitive advantage.

However, accounting businesses still have some manual recording tools used for daily financial and transactional information management (Emetaram & Uchime, 2021). Using manual recording tools like spreadsheets can limit access to current data and leaves little room for periodic reporting to take place outside of the closing of the books and the new month beginning. Organizations must be proactive and rely on preventative measures or automated controls instead of heavily relying on manual controls, which leads to a large amount of overtime during the financial closeout period. As companies proactively integrate more automation into their processes and procedures they will develop more of a competitive advantage.

Several questions may be posed regarding the use of AI tools in illicit or criminal activities. What about criminals and Artificial Intelligence? Or people with not-so-honorable intentions? (Bankins & Formosa, 2023; King et al., 2020) Does Artificial Intelligence help individuals like Trump portray an inflated value of wealth or assets? Does AI make it possible for spouses to hide wealth or assets during a divorce? The interaction between the individuals or groups mentioned above and AI is an incredibly involved issue that encompasses various areas, including cybersecurity, financial fraud, and beyond (King et al., 2020). The evolution of AI has created the potential to considerably boost efforts to fight criminal activities. Artificial Intelligence does this by improving the capabilities of both law enforcement and security professionals with things like predictive analytics, facial recognition, and data analytics, which helps to identify patterns related to illegal activities.

Criminals, on the other hand, along with others with malicious intent, are leveraging Artificial Intelligence to advance their illegal endeavors. AI is used for the development of more realistic phishing attacks, the automation of attempts to hack financial, municipal, and other private institutions, creating deepfake videos or audio recordings to facilitate frauds, and improving the logistics of illegal operations and other shady activities (King et al., 2020).

While AI can sometimes be the perpetrator of criminal activity, it can also be the target of criminal activity. For example, some attacks include manipulation of the data inputs to AI software systems that lead to incorrect outputs that can have dangerous outcomes in circumstances like identity verification systems and computer-led driving. The back-and-forth between shady activities and AI is a continuous game of chess, with developments and progress on one side prompting the evolution of the other side (Bankins & Formosa, 2023; Damerji & Salimi, 2021). This highlights the importance of continuing research and development in AI security measures and ethical issues combined with a legal foundation that can continue to adapt to the quickly changing technological landscape.

Does Artificial Intelligence create more opportunities for fraud in the accounting industry? The relationship between Artificial Intelligence and fraud in accounting or auditing is multifaceted (King et al., 2020). AI, on its own, does not lead to fraud but can, like any other tool, have an impact depending on how the technology is used. In one respect, AI can be powerful in the attempt to decrease fraud in accounting and auditing when designed, implemented, and used cautiously. The corporate community has to remain on alert and be aware of the potential to manipulate AI software systems or to unconsciously overlook instances of fraud. The human element in reviewing and interpreting AI findings remains important. Advanced technology must be combined with skilled human oversight in order to create an

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environment that is geared toward detecting and preventing fraud in the accounting sector.

Artificial Intelligence software is rapidly staking its place in the business world. Present-day software has been created to mimic humans' thoughts and decision-making capabilities (Damerji & Salimi, 2021; Qureshi et al., 1998). These software applications mimic the human neurological system and allow computers to learn from their mistakes. AI aims to replicate human reasoning and brain activity (Qureshi et al., 1998). The use of AI can improve decision-making by enhancing consistency. Artificial Intelligence software can turn non-expert staff into more experienced employees. This knowledge-sharing between the expert AI software and non-expert staff members allows a company to retain subject matter expertise even when employees move on (Qureshi et al., 1998).

This advanced technology allows AI software to learn skills from different problems (Qureshi et al., 1998). The decisions made based on the knowledge learned by computer software are more accurate and dependable than those made by human experts. Artificial Intelligence has discovered human logic, thinking, learning, and reasoning and uses computer technology to imitate a human expert's behavior. AI can identify, analyze, and solve business problems and implement those solutions. With AI technologies, computers can be more productive, and business processes can become more cost-efficient (Qureshi et al., 1998).

Due to the swiftly growing expansion of the usage of Artificial Intelligence software, we must perform studies like these to determine the growing impact of AI software on the accounting labor force and bottom-line costs. The current gap in the literature includes the need for more information on the economic effects of Artificial Intelligence systems on accounting firms. The basic expectations are that initially, execution will be expensive, but costs will decrease once Artificial Intelligence is implemented within the organization. Another gap is its effect on the expected six percent growth of the accounting workforce in the United States from 2021 to 2031.

This next part of the study discusses the procedures and methodology of the completed research. The following provides an overview of the steps that were taken to complete the research study. Also discussed are the factors that were taken into consideration when performing the analysis of this research study.

PROCEDURES & METHODOLOGY

Procedures and methodology are essential to the integrity of the research. This section covers the research paradigm in-depth, gives insight into the research design for the quantitative study, and mentions the assumptions that steer the research to prove or disprove the researcher's hypotheses. Next, the procedures used to determine the sampling size are discussed. Finally, the final section will describe the statistical tests utilized for the research.

A research paradigm for quantitative research is a set of foundational beliefs and assumptions that guide the research. These beliefs are expressed by various methodologies that frame the researcher's view of reality and the understanding and methods for gaining knowledge. The two most commonly used paradigms are positivism and post-positivism, and each paradigm has distinct characteristics. Positivism assumes a stable reality and can be objectively observed without interfering with the subject or phenomena being studied. This approach relies on measurable data when determining facts and finding patterns in the research. Post-positivism is different in that it recognizes that the foundational truths might not be attainable but can be approximated through the scientific method, all while acknowledging potential limitations and bias. Research paradigms use structured experiments, surveys, and statistics gathering to collect and analyze data. The goal of the research paradigms is to identify patterns, generalize findings, and test theories to relay the research results to broader audiences. This makes this approach the appropriate choice for studies looking to quantify variables and search out patterns between them.

This study is a quantitative research study based on deductive scientific realism (a big assumption that looks for pieces of evidence to evaluate it, while the qualitative approach lends itself to social constructivism). This quantitative comparative research aimed to investigate if there was a statistically significant difference in the impact of Artificial Intelligence software on the anticipated future labor force and revenues of the accounting industry. Artificial Intelligence software may impact the future of every profession, not just accounting. As the use of AI software increases, so does our need to understand the technology and its effects on every aspect of the accounting profession, from education to the workforce.

Quantitative research design is a more structured approach to collecting and analyzing numerical data (Ahmad et al., 2019). This research design is used to quantify behaviors or opinions and generalize results from a larger sample population. Quantitative research design focuses on measurements or numerical analysis of data collected through surveys or manipulation of previous statistical data using machine learning techniques (Ahmad et al., 2019). Quantitative research designs assist with making reliable and accurate conclusions using statistical data for data analysis. This research design is imperative to making informed decisions, testing hypotheses, and developing theories.

This quantitative research study utilized a causal-comparative or ex post facto design. Causal comparative design examines differences between variables with two or more levels for one or more dependent variables. In comparative designs, the event has already occurred. The purpose of this study is to evaluate the future impacts of AI technology on accounting firms, and the assessment of future outcomes is always challenging. To address the research questions, the research design can rely on an event that has already occurred – the decision by firms to adopt or not adopt AI tools prior to the survey collection date. Respondents who worked for firms that adopted AI tools prior to the survey (AI adopters) already

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had experience with AI, and their evaluation of AI may differ from those who worked for firms that had not yet adopted AI (non-adopters). Based on this distinction, the research design provided a means to address the research questions and compare future assessments of AI impacts between AI adopters and non-adopters.

The survey instrument used for this study was originally developed by Douglass and Holmes (2022). Permission to use the survey for this study was secured from the authors. The following table illustrates the relationship between the research questions and the survey questions, and the particular dependent variables used to address the three research questions are described in the previous section.

Table 1

IMPACT OF ARTIFICIAL INTELLIGENCE

Mapping Relationship Between Research and Survey Questions

Research Question	*Survey Question*	*Description*
RQ1: What statistically significant difference exists between present and future Accounting revenues before and after the increased usage of Artificial Intelligence software?	Q21	Accounting revenues are anticipated to increase due to the decrease in operating expenses caused by the decrease in the labor force caused by the increased use of AI.
	Q22	Accounting revenues are anticipated to decrease due to the increase in operating expenses caused by the increase in the adaptation and adoption of AI software in the industry.
	Q23	The increased adoption and advancement of AI will cause a significant shift in accounting revenues, either positive or negative.
	Q24	The accounting revenues will significantly increase with the increased use of AI.
	Q25	The future accounting revenues will significantly decrease with the adoption and increased use of AI.
RQ2: What statistically significant difference exists between the sizes of the present and future accounting labor force after the increase in the use of Artificial Intelligence software?	Q18	The development of AI will cause a significant decrease number of accountants required by both public and private companies as well as government regulators.
	Q19	The advancement of AI will lead to a shift in the accounting labor force, from more human to computer-based interactions.
	Q20	The growth of AI technology will change the focus of accounting curriculums and careers to include specialized computer skills.
RQ3: What statistically significant difference exists between the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation?	Q8	Using AI to handle automated tasks will reduce my workload.
	Q9	AI can be relied upon to make business decisions.
	Q10	I do not believe I will ever fully understand AI.
	Q11	As an accounting professional, educator, student, or CPA in the United States, I anticipate a rapidly changing work environment as a result of a combination of new AI technology and AI implementation.
	Q12	I'd rather NOT rely on AI to communicate with clients.
	Q13	AI has a risk of decreasing human interaction.
	Q14	AI technology will become a significant tool in client interactions.
	Q15	AI can help remove the burden of repetitive

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		administrative work and enable employees to focus on solving more complex issues while reducing the risk of error, allowing them to focus on value-added tasks.
	Q16	The development of AI will decrease the need for regulatory scrutiny.
	Q17	AI technology will be relied upon for assessing the risk of material misstatement at the account level.

Note: This table illustrates the relationship between the research questions and the survey questions tied to each research question.

The sample was drawn from a target population composed of all accountant industry professionals in the United States. These professionals could be CPAs, general accountants, accounting educators, or accounting students. Using G*Power analysis, the minimum sample size was 102 for a t-test of mean differences for independent samples. To account for item non-response and out-of-scope responses, the intended sample size collected from the target population was 135 respondents.

The survey instrument was distributed electronically by a paid survey on Survey Monkey (www.surveymonkey.com). Members of the target population were contacted through a LinkedIn group, Internal Audit and Risk Management Consultants. Survey information gathered included attitudes about AI, the industry subcategory of each accounting professional represented, and the anticipated impact of the future accounting labor force and revenues. Permission for survey usage was gained from each person taking the survey. The Survey Monkey data provided by each survey respondent was checked and validated before the statistical analysis was conducted.

Statistical tests are important tools for quantitative research that allow scholars to evaluate hypotheses about population characteristics based on sample data. These tests assist with determining the reliability, validity, and significance of the research questions. For example, statistical tests are used in business analytics to understand relationships between decision variables or to test behavioral hypotheses. The test selected for the research should depend on the research question, the kind of data collected, and the research design. These statistical tests provide insight into the observed data, make projections, and contribute to the knowledge base in their field. Researchers must have a deeper understanding of statistics to correctly choose and interpret these statistical tests and data.

The first research question was, “What statistically significant difference exists between present and future accounting revenues before and after the increased usage of Artificial Intelligence software?” The second research question was, “What statistically significant difference exists between the sizes of the present and future accounting labor force after the increase in usage of Artificial Intelligence software.” Finally, the third research question was, “What statistically significant difference exists between the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation.” The t-test of mean differences for independent samples was used to answer all three research questions for this study (Spatz, 2019).

The t-tests used in this study were two-sided t-tests that detect both positive and negative mean differences (Spatz, 2019). The two-tailed test was utilized because the null hypothesis associated with each research question may be rejected in two cases. The two possibilities of outcomes of this test are that the sample population has a mean less than the null hypothesis or the sample population has a mean greater than the null hypothesis. Two-sided hypothesis tests are discussed in Chapter 10 of Spatz (2019).

After the data were collected from the survey, all responses were saved in an Excel spreadsheet and converted to CSV format. The CSV file was transferred to JASP for initial data review, coding, and cleaning. First, all responses with missing values were removed from the data set. Next, the control variable for Research Questions One, Two, and Three (named “Use”) was generated. All positive responses were labeled "Agree" for AI-adopters, and all negative responses were labeled "Disagree" for non-adopters. The missing or "Neither agree nor disagree" responses were left blank for this control variable.

The dependent variable for Research Question One was the response to Survey Question 24 (named “RQ1”). The dependent variable for Research Question Two was the response to Survey Question 18 (named “RQ2”). The dependent variable for Research Question Three was the response to Survey Question 11 (named “RQ3”). In each case, the seven-point Likert responses for the associated survey questions (see the map in Table 1) were coded as integers from one (“Strongly disagree”) to seven (“Strongly agree”).

Using these composed variables, the hypothesis tests associated with the three main research questions were conducted in JASP at the 5% level (i.e., Type I error rate). For example, the two-sided t-test of mean differences for Research Question One was based on the dependent variable RQ1 and the control variable “Use” under the independence assumption. The t-test also required both samples to have the same variances, and this model assumption was evaluated for each research question with Levene’s variance homogeneity test.

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The procedures and methodology depicted was essential to the integrity of the research conducted in this study. This project aimed to investigate if there is a statistically significant difference in the impact of Artificial Intelligence software on the anticipated future labor force and revenues of the accounting industry or to what extent Artificial Intelligence software was a disruptive technology. This study was quantitative with a causal-comparative or ex-post facto design. The minimum number of responses required for the survey was 102 based on G*Power analysis, and the goal was to collect at least 135 responses. The next section will summarize the findings of the completed study.

DISCUSSION & IMPLICATIONS OF STUDY

Before research is conducted, the research questions are developed from gaps in the existing literature, and the proposed study is evaluated to determine how well the research questions can be explored within the confines of available resources, methodology, and the research scope (Ahmad et al., 2019). After the planned research is completed, the review phase can circle back to the literature and evaluate how the research findings aligned or differed from other scholarly results on the same or similar research questions. The review of practical implications can enhance the knowledge gained from the reported findings. This section separately addresses the practical implications of the findings associated with each research question.

Research Question One

The first research question was: "What statistically significant difference exists between present and future accounting revenues before and after the increased usage of Artificial Intelligence software?" For this question, the t-test of mean differences was strongly significant, and the null hypothesis was rejected at the 5% level. The previous studies discussed in the Literature Review did not directly evaluate the effect of the increased usage of AI on future accounting revenues. Some researchers have stated the relationship between AI adoption and future revenues and how the use of Artificial Intelligence has become more mainstream (Hazelbaker & Lin, 2019). However, both the existing research and the findings from this study indicated that the increased usage of Artificial Intelligence software is expected to impact costs and revenues for every profession (Petkov, 2020), including the accounting industry. This study directly answered this research question, and many of the respondents to the survey believed that future revenues would increase after AI adoption.

Recent estimates projected that AI would deliver an economic output of about $13 trillion by 2030 (Sagarika et al., 2022). However, these projections raise several related questions. How will AI deliver this type of output? How will Artificial Intelligence impact the revenue cycle? How will AI affect the relationship between costs, revenues, and efficiency of firms? Efficiency takes into consideration both inputs and outputs. Supervisors and other decision-makers in organizations must be able to deal with all the possibilities and problems, or opportunities and challenges, that come with the adoption of AI (Berente et al., 2021). Given the uncertainties expressed by the survey respondents for this study, managers will be challenged to allocate resources efficiently as they introduce and oversee AI projects.

The future impact of Artificial Intelligence on society will depend on how the increased revenues and profits from AI are divided. The existing research has been developed from previous iterations of AI technologies like factory robots, and these results only provided partial snapshots of the economic influence of AI. Without a better understanding of Artificial Intelligence's impact on the economy, policymakers cannot design policies to prepare for the changes induced by AI adoption.

A quest to increase revenues or profits and improve efficiency could potentially lead to an increase in the jobless rate. Governments and other organizations will search for new opportunities to create lower costs and increase revenues by becoming more efficient and productive. Two options can lead to this increase in revenue: minimizing costs or maximizing value. These new developments and discoveries will lead to disruptive changes in the business landscape and the global economy (Cordos & Tiron-Tudor, 2023). Companies with low revenues in their income statements or decreases in profitability and return on capital ratio may hedge these outcomes by pursuing more efficiency, productivity, and lower-cost production methods or resources (Dirican, 2015).

The results of this research extended the knowledge base in the accounting discipline by connecting the impacts of increased Artificial Intelligence usage to future revenues in this arena. The findings advanced the concepts of psychological theory by confirming that, once inserted in the human environment, AI adoption will require some behavioral changes in the workplaces where humans interact with Artificial Intelligence software (Irangani et al., 2021). The findings also advanced the concepts of economic and systems theory, which are complements of psychological theory, by showing that business decisions are based on information from accounting data. Also, systems theory deals with the interactions between Artificial Intelligence and human systems or society (Swanson, 2001), and it closes the gap between ideas regarding human interaction with Artificial Intelligence software and the required financial resources.

Research Question Two

The next research question was, "What statistically significant difference exists between the sizes of the present and future accounting labor force after the increase in usage of Artificial Intelligence software?" Many of the respondents surveyed for this study believed that AI adoption would substantially impact job functions in the accounting labor force. Psychological theory has important implications here because human employees compete with other humans and AI tools to achieve their goals (Akanksha et al., 2022; Baggio & Omana, 2019). Ideally, a worker would like to be better than other humans and AI software or bots to maintain their position in the organization (Irangani et al., 2021). If workers feel

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threatened by AI, these employees may withhold information to maintain job security.

Previous research shows that students believe data analysts and Artificial Intelligence will replace accounting jobs. They also believe companies will first replace entry-level positions (Hsiao & Lei, 2023). While most of the subjects surveyed for other studies believed that computers detected fraud more efficiently, they were also concerned about the ethical issues that may occur when relying on the use of technology (Hsiao & Lei, 2023). Following the strong agreement recorded for Question 20 in this study, accounting curriculums should be modified to allow early exposure to data analysis and Artificial Intelligence skills. These changes would allow students to get ahead of the game instead of waiting to learn these skills once on the job (Akanksha et al., 2022).

The respondents expressed uncertainty about the interaction of humans with AI tools. These findings suggested that the newly emergent AI-dependent workforce may suffer from a lack of communication and the human touch, which may enhance the threat to human job security. Corporations will also have to deal with being more susceptible to potential breaches of data privacy (Hsiao & Lei, 2023). Companies should look outside the box to adapt to the data-oriented job market by partnering with accounting education programs in universities, mentoring students, and helping them obtain more marketable skills when dealing with changing workforce technology. Businesses should also regularly communicate the changing landscape with accounting education establishments to ensure that schools adequately prepare students for the workforce (Hsiao & Lei, 2023).

The discussion about preparing students for the workforce must also acknowledge recent trends in accounting education enrollments. The Spring 2020 undergraduate enrollment declined by 9.4%, which was the largest decline in fifty years (Dawkins et al., 2020). Projected bachelor's, master's, and doctoral accounting enrollments were down 4%, 6%, and 23% in 2018 compared with 2016, respectively, and the number of new CPA exam candidates hit a 10-year low. In its Future of Jobs Report (2016), the World Economic Forum projected that the top three in-demand skills expected to see increased demand in 2020 were complex problem-solving, critical thinking, and creativity (Dawkins et al., 2020).

The accounting profession reacted to these shifts in the nature of accounting work by having the National Association of State Boards of Accountancy (NASBA) and the AICPA update the existing CPA licensure model to reflect the rapid transformation in the anticipated competencies (Dawkins et al., 2020). Feedback from those questioned about how to transform the current licensure model led to the development of a Core + Discipline licensure model. This model requires every accounting candidate to complete the same core requirements in accounting, auditing, taxation, and technology. The candidates must also exhibit a deeper understanding of business reporting and analysis, information systems and controls, and tax compliance and planning. This model is flexible and adaptable over time as disciplines and requirements change (Dawkins et al., 2020).

Recent rapid developments in technologies are having a significant effect on audit and assurance engagements. Examples include the use of automated tools and techniques and changes in how engagement teams are structured and interact with each other (Dawkins et al., 2020). In recent years, the NASBA and AICPA have committed to monitoring the use of digital technologies to determine whether existing audit standards associated with client-acceptance decisions and assurance services remain relevant and appropriate to the changing accounting landscape (Dawkins et al., 2020).

The roles of human employees would switch to a more analytical role than having to input and analyze the information, which is solely the responsibility of accounting professionals (Cordos & Tiron-Tudor, 2023). The results from this study largely agree with this claim, and they suggested that implementing Artificial Intelligence software in accounting may significantly control costs for accounting companies. Implementing AI tools may accelerate the growth of revenues or profits in that profession due to fewer man-hours spent on creating and analyzing accounting data (Petkov, 2020).

As with Research Question One, the results for Research Question Two supported the knowledge base in accounting and the relationship between firms and the future accounting labor market. The research findings suggested that accountants could benefit from this disruptive technology if it reduces the time spent on mundane tasks such as preparing financial statements, collecting accounting data, and performing data analysis. These results also extended the systems theory knowledge base by indicating that innovative technology may provide additional advantages for the accounting labor force. In particular, AI tools may transform simple, mundane job tasks to become less of a burden for the current labor force and help accountants perform their duties faster.

Research Question Three

The third and final research question was: "What statistically significant difference exists between the present and anticipated future work environment resulting from the combination of new AI technology and AI implementation?" Many respondents to this study believed that AI adoption would lead to a rapidly changing work environment. Most accounting professionals, students, and educators surveyed also believe using Artificial Intelligence for automated tasks would reduce their workload. However, they would not rely on Artificial Intelligence to communicate with clients. Decisions were split on whether Artificial Intelligence could be relied upon to make business decisions, but the respondents agreed that it would become a significant tool in client interactions. These attitudes may stem from the belief that the respondents would never fully understand Artificial Intelligence.

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Artificial Intelligence is rapidly changing the workplace and everyone around it, and this is only the beginning (Baggio & Omana, 2019). AI is altering corporate operations and decision-making across all parts of the economy—and the possibilities are endless (Kolbjornsrud, 2024). AI-driven software systems can sense, comprehend, act, and learn in multifaceted environments. The impact of three kinds of AI deployment—replacing some simple and complex tasks (replacement), tending the machine (creating new forms of human work), and amplifying human skills (augmenting/assisting workers)—may lead to a decrease in meaningful work for human employees (Bankins & Formosa, 2023). Past research reported technology's dual positive and negative effects on various aspects of meaningful work. For example, technology use can cause workers to gain new skills and increase their autonomy, but it can also degrade their skills and serve to control them (Bankins & Formosa, 2023).

The roles between humans and their machine counterparts are only beginning to emerge, as these roles are rapidly expanding (Baggio & Omana, 2019). As a result, Artificial Intelligence is likely to replace humans in most mundane and repetitive jobs and tasks (Akanksha et al., 2022). Practical applications will continue to make it easier for systems to access and interface with AI, which may increase adoption. For this reason, more flexible workplaces will be the ones to thrive in the future (Baggio & Omana, 2019).

These changes may cause jobs with low or medium qualifications to be eliminated or replaced. For example, 47% of American workers are at risk of being replaced, but almost 70% of workers are at risk in developing countries like India (Baggio & Omana, 2019). Chinese companies have already begun the process of replacing 90% of the human workforce with robots. Due to this rapid evolution of the transition from human to Artificial Intelligence in the workforce, many organizations, such as the Florida Institute of CPAs, have begun campaigns to partner with the legislatures in the states and national governments to regulate the use of AI. These efforts are intended to ensure that the entire human workforce is not wiped out due to the increased use of Artificial Intelligence.

The long-term effect on companies is that they will be leaner and have less hierarchical structure in their companies. Every person situated between an activity and its decision-maker is an additional cost (Baggio & Omana, 2019). The long-term impact of AI will also cause work to be distinguished between routine and non-routine activities. New and existing talent "will have the opportunity to create new processes, applications, and solutions" as technology changes the roles, responsibilities, and interactions between humans and Artificial Intelligence (Baggio & Omana, 2019, p. 31). The ability to automate processes will reduce the repetitiveness of mundane tasks and change the landscape for many workers. This change in the corporate atmosphere will affect both blue and white-collar employees. Jobs will be lost, but jobs that require the ability to create and interact with human emotion cannot be eliminated. Organizations will begin reinventing themselves to maintain relevancy (Baggio & Omana, 2019).

The ability to adapt will be the determining factor in whether employees can thrive in this environment. Employees must be willing to learn new skills. To prepare students for this changing environment, colleges and universities must focus more on teaching soft skills like time management, communication, social interaction, reliability, accepting criticism, and lifelong learning (Baggio & Omana, 2019). AI has the potential to be one of the most important technological advancements in the coming years, but the full potential has yet to be seen. If not understood by the business world, AI will cause more challenges than opportunities.

The results of this study support and extend the knowledge base in the accounting discipline for a couple of reasons. As stated previously, this study further extended and united the concept of using Artificial Intelligence to manage the rapidly changing workforce environment for accountants. AI may increase the accuracy of analysis and data entry, make business processes more cost-efficient, and reduce the time needed to identify and implement solutions (Qureshi et al., 1998). The AI software will continually evolve and learn as more information becomes available to its system (Qureshi et al., 1998).

Limitations of the Study

The purpose of this section is to acknowledge the limitations of this study, which is crucial to providing a balanced and authentic assessment of the validity and reliability of the research. Assessing the limitations of the research is also essential because it allows the reader to assess potential applications of the results. This section addresses some of those limitations discovered during the research process that may affect the interpretation of findings or plans for future research.

The first limitation was that the study only covered the United States. Although the continental United States is a vast and economically diverse region, the study would have been more informative if extended to include multiple countries. With this extension, the research could have evaluated the anticipated impacts of AI adoption under different labor markets and regulatory environments.

Next, the investigation only considered future revenues and labor force levels, which introduced some uncertainty regarding the assessment of unobserved (but anticipated) events. Also, the research did not directly address past and present uses and impacts of AI tools. The study would have been more robust if it could have measured the evolution of these impacts over time.

Third, the study was limited because it did not evaluate the survey responses across small to large firms. The survey for this study did not collect information about the firm size to avoid confidentiality issues. However, the anticipated and actual impacts of AI tools on firm revenues and workers may vary across different-sized businesses.

Fourth, the study results may be limited by how the sample was collected. The initial target population only included subjects from Florida, but this plan was too restrictive. Next,

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the target population was expanded to include the entire United States. However, the sample collection process did not generate enough responses to meet the minimum sample size. Finally, the sample collection process was expanded to include paid responses generated through Survey Monkey. While the resulting sample exceeded the minimum sample size, the changes to the sampling process may have introduced unobserved heterogeneity in the data.

Finally, the means used to compare estimates of the anticipated future impacts of AI adoptions was imperfect. The responses to the survey questions were compared by separating respondents into groups of AI adopters and non-adopters based on self-reported use of AI tools by their employer. This approach may avoid endogeneity bias because the adoption decision was made before the survey was administered, and it may avoid selection bias because the respondents were unlikely to be involved in the adoption decision. However, the results may be subject to reporting errors if a respondent was not fully aware of the AI adoption decisions made by their employer.

Implications for Future Study

The purpose of this section is to evaluate new areas for exploration, methods for further research, or ways to improve understanding of the existing knowledge in that field. These implications may serve to advance science and the current knowledge base in the accounting literature. These implications may be especially important for future research on relatively new technologies like Artificial Intelligence.

As previously noted, future extensions of this work could collect information on the size of business enterprises employing the survey respondents. AI tools may involve significant initial investments, maintenance, and software update costs. The adoption decision may be different for small and large businesses. Also, larger firms may employ a more specialized labor force, and the results of this study imply that the anticipated impact of AI adoption may differ by job function. Accordingly, future research could determine if AI tools provide comparative advantages or disadvantages for smaller firms that employ accounting professionals who engage in varied tasks.

Finally, extensions of this study could examine the educational implications of Artificial Intelligence, and the results of this study suggested several vital questions. How will the new skills necessary for implementing Artificial Intelligence usage affect degree programs? Will any changes in education preparation need to occur to better prepare the students for incorporation into the future workforce? Do the educational implications differ across topical areas like finance, education, marketing, or law? The practical implications of these research extensions may be important for educators and students in many fields

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