# TRANSFORMING THE LANDSCAPE OF THE EMERGING ACCOUNTING PROFESSION AFTER ARTIFICIAL INTELLIGENCE (AI) DISRUPTION

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Abstract. The evolution of technology from the 4.0 to the 5.0 revolution poses a threat to their professions. According to KPMG's 2018 data, Artificial Intelligence (AI) stands poised to replace accountants in the foreseeable future. The advent of AI brings about considerable disruption for emerging accountants. This study endeavours to explore the possibility of AI supplanting the accounting profession and the readiness of young accountants to face these threats. Employing a literature review method anchored in netnography, the research draws upon prior studies and online sources. The results show that AI The results show that AI is developing tremendously in various forms and provides smart alternatives in completing accountant tasks. The success of AI disruption is demonstrated by the extent of AI disruption in all areas of the accounting profession i.e. financial accounting, management accounting, and public accounting. Ultimately, this research contributes to fostering awareness to young accountants for being ready in facing AI disruption.

Key words: artificial intelligence (AI), accounting profession, industrial revolution.

JEL Classification Codes: M41, M15, O33

#### BACKGROUND

The Industrial Revolution 4.0 and 5.0 represents a transformation in the global development landscape, marked by the emergence of the Internet of Things (IoT). This technological advancement has brought about a new era of technological sophistication, where convenience in work is now provided by the Internet. Technology has the potential to enhance the quality of human life by making daily work easier. Industry 4.0 and 5.0 have the capacity to facilitate various jobs in different fields, with the accounting profession being one of the most notable beneficiaries (Rosmida, 2019). This necessitates that accountants adapt to technological developments and be able to adapt, as well as have a high sense of curiosity in recognising opportunities that arise as a result of advances in information technology, as well as increasing developments in digital utilisation, in using the internet to facilitate daily work. However, they are influenced by the industrial revolution and the various technologies that resulted from it, which were designed to make daily work easier. A discussion of the use of the Internet and digital media regarding the use of IoT in the field of accounting, such as cloud computing, big data, machine learning and artificial intelligence, is presented. This discussion illustrates how these tools facilitate the role of accountants in the field of finance and accounting in promoting business performance.

The evolution of information technology in the field of accounting can be broadly divided into two eras: the first, which saw the advent of software and software applications, and the second, which



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began with the emergence of artificial intelligence, namely artificial intelligence. With regard to the development of big data, which facilitates work in the accounting profession, it can be argued that it represents a significant challenge to the accounting profession, given the influence of IoT developments in the era of the fourth industrial revolution (Rosmida, 2019. The concept of variables emerged as a consequence of the advent of big data, which has the potential to be employed as a contemporary data management tool that will supersede traditional data management (Pujianto et al., 2018). The concept of applying big data includes: volume, variety, value, and velocity (Sirait, 2016).

The rapid development of technology has created new, more modern systems based on artificial intelligence automation. These systems have dramatically changed various traditional work practices, especially in the field of accounting. According to data from the BBC and KPMG, the accounting profession ranks 21st out of a total of 366 jobs that will be replaced by artificial intelligence (AI) technology, with an elimination rate of 96% (Stancheva 2019). This data is further corroborated by a survey conducted by KPMG among more than 120 internal auditors from the KPMG IT Internal Audit conference in 2016 and 2017. The survey revealed that almost half of the auditors from various organisations had already implemented the use of artificial intelligence. Nevertheless, the survey also indicates that at least 80% of internal auditors remain sceptical about the potential applications of artificial intelligence in the field of accounting. However, 70% of them concede that AI could potentially displace their roles (KPMG 2018b).

The advent of AI is a pivotal aspect of the evolution of information technology, particularly in the form of automation-based AI, which has the potential to streamline the work of accountants. It is imperative for accountants to adapt to the ever-changing landscape of information technology, which is undergoing a profound transformation due to the advent of the 4.0 and 5.0 eras. Digitalization is a crucial aspect of every company's operations. The capacity for common sense, or the ability to reason, requires a more nuanced approach than that which is currently possible with AI. While AI can process information, it lacks the capacity for understanding the nuances and complexities of human thought and behaviour. This is evident in the fact that an AI cannot make business decisions without first understanding the financial implications involved, which requires an understanding of the information being processed.

From the interpretation of KPMG data, accounting is one of the professions affected by artificial intelligence, because the field of work of the accounting profession is developing rapidly every year in the field of information technology, which is strengthened by the emergence of AI, which makes the accounting profession easier, which is now not only big data, there are several AI latest. *Machine Learning* (MCL), *Robotic Process Automation* (RPA) and Blockchain. This affects the continuation of the accounting profession, especially young accountants, and who is causing concern among students because the accounting profession is starting to be disrupted by AI, especially in Indonesia, in 2020 there will be around 265 thousand accounting students and this will continue to increase every year (IAI 2020). Research contributed as a self awareness, which answers the concerns of young accountants regarding the impact of *AI* in replacing the role of accountants in the future, narrative analysis, which discusses the development of AI and the impact of its use in various accounting fields.

#### LITERATURE REVIEW

Initially termed in 1956, *Artificial Intelligence* (AI) is one of the newest research fields in science and engineering (Russell et al., 2016). AI is not just computer science and mathematics but an interdisciplinary field with some significant contributions from other disciplines such as economics, neuro-science, and psychology (Taulli, 2019). Nowaday, AI is a broad term that covers a wide range of technologies and approaches used for a wide variety of tasks. *Machine Learning* (ML) is a group of AI methods among the most popular. *Machine Learning* performance improves with experience and aims to solve problems using historical data or previous examples (Libbrecht and Noble, 2015). It powers many aspects of modern society and is, for example, used to identify objects in images, which are increasingly present in consumer products such as smartphones or cameras (LeCun et al, 2015).

Depending on how *Machine Learning* techniques learn, they can be broadly defined into two categories: Supervised and unsupervised learning techniques (Bas tanlar and Uysal, 2014).

Blockchain decentralisation allows auditors to view transparent and immutable financial transactions, transparent (Shu et al., 2022). This capability can transform auditing and improve the accuracy of financial reports which improves the accuracy of reports. However, as promising as blockchain accounting is, there are some significant challenges. Scalability and energy consumption pose substantial barriers to mainstream adoption of blockchain technology in accounting (Khan, Jung, & Hashmani, 2021). Ethical utilisation of blockchain in accounting requires addressing regulatory compliance and data privacy concerns (Han et al., 2023).

Here are some AI products in accounting from previous research:

AI Products	Author	Brief Description
Blockchain	Mahdani, Risnafitri, Mardiaton, 2023.	Blockchain is a technology that enables centralized and transparent data storage. In simple terms, a blockchain can be thought of as a digital ledger distributed across many computers across a network. The information stored in a blockchain is referred to as "blocks" and each "block" has a link to the previous block, forming an
Claud	Es amul Dori	Immutable chain.
Accounting	Facrul Rozi, 2023.	Cloud accounting is a digital of <i>online-based</i> accounting system that uses <i>Cloud</i> <i>Computing</i> technology, where customers can access accounting functions and financial analysis using computers or other devices. This is due to the simplification of accounting documents and the shift of certain accounting operations to cloud- based electronic platforms that have significantly changed accounting information systems (Ionescu et al., 2013).
Optival Character Recognition	Althim, Ilmi, & Jemaris, 2023.	<i>Optical Character Recognition</i> (OCR) in accounting is a technology used to convert images or documents containing text which could be edited electronically. In an accounting context, OCR allows users to take data from physical documents such as invoices, receipts, or financial statements and convert them into a digital format that can be processed by accounting software or spreadsheets.
Automatic	Rejeki, S. S,	Automatic Robotic Process Automation (RPA) in accounting refers to the use
Robotic	2023.	of software to automate repetitive and rule-based tasks in the accounting
Process		process. <i>Robotic Process Automation</i> (RPA) allows computer programs to mimic human interaction with information systems, such as retrieving data from one system, entering it into another system, or performing calculations based on specific rules.
Machine	Akmaludiin &	Machine Learning (ML) is a subset of AI that allows computer systems to learn from
Learning & Smart Machine	Dewayanto, 2023	data without having to be explicitly programmed. In <i>Machine Learning</i> (ML), programmed algorithms are used in analyzing data, the need to identify patterns, and can be used as a decision-making or prediction tool through the information provided. Meanwhile, <i>Smart Machine</i> is a system equipped with <i>AI</i> that is used to understand the environment, interact with users, and make decisions independently without human intervention.
Enterprise	Sembiring, Putri,	Enterprise Resource Planning (ERP) is an integrated software system used by
Resource Planning	Atmojo, Sianipar, Hendrawan, 2024.	organizations in managing various needs in business data processing as a whole. <i>Enterprise Resource Planning</i> (ERP) combines various departmental functions such as finance, production, human resources, inventory, and sales into one integrated platform.

Table	1	Previous	Research	on AI
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#### **METHODOLOGY**

The methodology utilised in this research is qualitative, utilising a netnography approach. This approach entails conducting a comprehensive literature search through a variety of sources, including articles published between 2018 and 2023. These articles have been identified as pertinent to

understanding the impact of AI on the global accounting profession. The research was conducted online through a combination of online media and internet research. Online media included websites, internet search engines, and digital magazines, such as *Garba Digital Reference*, Publish or Perish, *Chrome*, and the University of Lampung Library reference media. The articles that were discussed in several of these sources were used to inform the research. The research findings will take the form of a narrative analysis discussing a collection of AI product data implemented by companies and narrating the impact of AI usage in the field of accounting.

### RESULT

The topic of digital transformation in the use of AI in the accounting profession is frequently discussed by numerous parties, particularly accounting professionals. However, it is crucial to comprehend the advantages and disadvantages of AI use in accounting to evaluate its suitability for integration into the realm of economics, particularly in the context of financial reporting for decision-making in optimised company development strategies. In this regard, the prevalence of AI utilisation among key stakeholders is evident. A systematic review was conducted to assess the importance of digital transformation and AI in accounting. The review included articles on the use of AI in accounting, as well as its role in the field. The articles were then organized into a table, including author, title, year, variables (if any), method and results. After obtaining relevant articles that meet the criteria of the examiner, the findings of these articles will be evaluated through a comprehensive table.

### 1. Varieties of Artificial Intelligence (AI)

#### 1. Block Chain

According to Davidson et al, blockchain technology operates as a decentralized peer-to-peer network. Blockchain is a decentralized data-based system that is useful in recording digital transactions safely and transparently. The blockchain input itself is transaction data that is distributed to a Peer-to-Peer (P2P) network consisting of various nodes (individual computers). The node will validate the transaction and after that the transaction will be combined with other transactions to create a new data block that is useful for the master cash book. Then the new data block that has been combined is added to the blockchain and stored permanently and access is given not only to certain parties. The output produced by Blockchain is transaction data that is centralised and distributed to several nodes, not only stored in one central database.

### 2. Cloud Computing

Cloud computing is a technological innovation that uses the internet as a center for data and application management activities to facilitate human work in certain fields, especially fields that manage data. Using cloud computing allows data management to be carried out comprehensively in an organisation or company. The uses of cloud computing in the accounting field include; recording purchases of goods/services, sales, recording cash in and out that occur, journaling, posting to the ledger and preparing financial reports. Computing input is accounting data that is intended to be managed and stored. In cloud computing, accounting data will be managed until the data becomes a financial report, which is the same process as the accounting cycle, but in cloud computing the activities can be efficient and fast.

#### 3. Big Data

According to Kitchin, big data is data that has a large volume and high speed, which can be said to be real-time in processing data, in a variety of formats in the form of the entire population in a system. The input of big data itself is data that is managed by collecting data until the data becomes large data, which is useful in the accounting process of obtaining financial information. Big data can help management accounting in producing efficient financial reports because big data can provide immediate analysis without having to wait for the month-end summary, can detect fraud because big data can identify unusual patterns in financial transactions, and can help prepare financial planning in the future through predictive analysis.

## 4. Optical Character Recognition (OCR)

*Optical Character Recognition* (OCR) is a computer system that is able to identify and read letters from images, whether from printed documents such as a printer or typewriter, or handwritten. The process begins by digitising documents through scanning. After that, OCR is used to extract data from documents automatically, then the data is entered into the accounting system without the need to enter it manually. The process helps save time and reduces the risk of human error in the data entry process. *Optical Character Recognition* (OCR) will help process accounting transaction documents, namely by turning them into information in the system without having to do it manually. This makes activities efficient and saves time.

### 5. Machine Learning

Machine Learning is a type of AI that uses statistics to determine patterns in large amounts of data and make predictions and make accurate forecasts for the future (Dogan & Birant, 2021, p.1). In its use, Machine Learning is able to discover complex patterns that may be missed during human analysis so that it can be used to analyse data for future predictions. This can make it easier for the management accountant profession to carry out its activities, such as automating the accounting process, starting from scanning documents by entering keywords such as date and amount, then the system will immediately create relevant journals related to the transaction, and analyze the data. With Machine Learning, companies can increase their efficiency.

## 6. Robotic Process Automation (RPA)

RPA is a technology that employs software to automatically perform repetitive tasks in a business context. Its main purpose is to enhance efficiency by reducing monotonous work. *Robotic Process Automation* (RPA) operates by following pre-programmed instructions in the software to complete these tasks autonomously. It simplifies various accounting duties such as transaction logging, financial reporting, payments, inventory management, bank reconciliation, accounts receivable, and tax reporting.

# 7. Smart Machine

Represents a sophisticated automation system that integrates *AI* and robotics to undertake tasks traditionally performed by humans. This technology aims to enhance efficiency and productivity in several domains, particularly in accounting and finance. Utilising *AI* algorithms, these machines efficiently process and analyse data, recognize patterns, and carry out repetitive tasks like categorising transactions, generating financial reports, and managing inventory. Furthermore, *Smart Machine* is designed to learn from their operational experiences, continually improving their task execution efficiency as they adapt and evolve over time.

# 8. Enterprise Resource Planning (ERP)

Constitutes a comprehensive system that amalgamates diverse business processes within an organization into a cohesive entity. Its primary objective is to facilitate efficient business management by furnishing prompt and precise information. By consolidating data from numerous departments, *Enterprise Resource Planning* (ERP) centralizes information accessibility, ensuring it is readily available to all pertinent stakeholders.

# 2. The impact of artificial intelligence (AI) on the future of the accountancy profession

The evolving landscape of the accounting profession has garnered considerable attention from the public sphere. The demand for accountants is burgeoning, particularly within the realm of business. Amidst the continuous advancements in technology and the process of globalization, accounting has emerged as the pivotal element in comprehending and effectively managing corporate finances. This domain encompasses three primary facets: financial accounting, managerial accounting, and public accounting. Financial accounting is dedicated to the meticulous recording, analysis, and dissemination of financial information to a diverse array of stakeholders.

Conversely, managerial accounting is geared towards leveraging such information for internal decision-making processes within an organization. In contrast, public accounting serves as an impartial watchdog, ensuring adherence to compliance standards and fostering transparency in the financial reporting of publicly-traded companies. The advent of *Artificial Intelligence* (AI) has gradually reshape the conventional role of accountants, transitioning them from mere data processors to strategic advisors adept at extrapolating and harnessing actionable business insights from data analytics.

#### **2.1 Financial Accounting**

According to Kieso, financial accounting is a set of activity processes in preparing financial reports based on accounting standards that are used as internal party accountability to external parties. Financial accounting is a set of company activity processes to create a financial report, where activities include 1). Recording financial transactions, 2). Preparation of financial statements, 3). Financial Analysis, 4). Tax reporting, 5). Internal audit.

By analysing the use of types of AI and financial accounting work, it was found that there are several AIs that threaten to replace the financial accounting profession. The results of the analysis showed that the work of recording transactions and preparing financial reports is threatened to be replaced by blockchain, cloud computing, *Optical Character Recognition* (OCR) and *Robotic Process Automation* (RPA). The related work of financial accounting, to store the company's financial data, is threatened to be replaced by big data and enterprise resource planning. In terms of auditing and tax reporting expertise, the impact of the emergence of AI is to make it easier to carry out auditing and tax reporting processes, such as *Big Data*, which makes it very easy for accountants to find financial data for materials in the auditing process.

Fundamentally, the existence of *Artificial Intelligence* (AI) has many positive implications for the profession of financial accountancy. By using *Artificial Intelligence* (AI), financial accountants will be able to find financial data, record transactions and prepare financial reports more easily. Although there is a risk that the role of the accountancy profession will be replaced by the sophistication of AI technology, if approached in the right way, AI has a positive impact on the accounting profession.

#### 2.2 Management Accounting

Management accounting focuses on generating information for the company internally. Management accounting is the process of producing financial data to make decisions in carrying out managerial functions. The main objective of management accounting is to help management effectively plan, control and make decisions to achieve the company's strategic and operational goals. Management accounting tasks include 1). Information provider, 2). Analysis and interpretation, 3). Planning and budgeting, 4). Performance control, and 5). Information Systems Development.

In the current era of technological disruption, one aspect that has had a major impact on the field of management accounting is the presence of AI technology, especially in the form of *Big Data* and *Machine Learning*.Management accounting in carrying out its duties obtains a large amount of information relating to the internal company, then from this data the accountant processes it until it becomes information, then from this information the accountant will make decisions to predict the company's operational conditions in the future. The development of AI technology has had a rapid impact on management accounting, namely helping accountants make efficient decisions in managing companies, where the result of the information is useful for planning, controlling, evaluating performance and making strategic decisions.

The existence of *Big Data* currently has a big impact on the role of the accounting profession, namely helping companies analyze data such as financial transactions. Traditional management accounting is not enough to meet company information needs because in the revolutionary era companies are faced with very large and complex data, therefore technology is needed that can help companies process data.*Machine Learning* has great potential in the accounting profession because of its ability to process data both quickly and accurately. Through this potential, *Machine Learning* enables the collection of more in-depth and timely information, and its capabilities are used to improve decision-making capabilities through complex data analysis. Therefore, *Machine Learning* provides in-depth insights to support better business decision making, and also helps in optimizing budget use and efficient cost management. The task of the accounting profession in making plans or decisions will be greatly helped by *Machine Learning*.

*Optical Character Recognition* (OCR) OCR will automatically record changes to documents or images provided to produce data that is useful for preparing financial reports. *Optical Character Recognition* (OCR) will be able to replace the accounting profession which records financial transactions manually. The presence of *Optical Character Recognition* (OCR) is very helpful and makes it easier to record company financial transactions.

*Robotic Process Automation* (RPA) will replace the role of accountants in routine, rule-based and time-consuming manual processes. For example, collecting accounts receivable, paying bills, or reconciling accounts. Processes such as receiving invoices from suppliers, matching invoices to purchase orders, payment, and payment processing are typically repetitive in the business cycle. Therefore, *Robotic Process Automation* (RPA) will automatically carry out these steps without human participation and can replace the accounting profession.

Therefore, the disruption of AI technology, especially *Big Data, Machine Learning, Optical Character Recognition* (OCR), and *Robotic Process Automation* (RPA) has had an impact on the management accounting profession, namely that the profession can be replaced by AI who come to provide convenience in managing data, making decisions and efficiency in carrying out their duties as an accountant.

#### 2.3 Public Sector Accounting

Public sector accounting entails a series of procedures aimed at identifying, evaluating, recording, and communicating information regarding the economic transactions of an entity. This information serves as the foundation for economic decision-making by various pertinent stakeholders (Abdul Halim 2018:3). Public Accounting represents a discipline responsible for managing the finances of public institutions, including governmental bodies and non-profit organizations, ensuring transparent and accountable use of public funds. This involves activities such as auditing, tax administration, and management consulting. With the advent of technological advancements, notably in AI, there has been a substantial transformation in the landscape of public accounting.

Artificial Intelligence (AI) presents opportunities for enhancing efficiency and accuracy in financial data processing, enabling rapid and precise analysis of large-scale data sets compared to traditional methods. Deloitte's analyses, exploring the impact of AI in the accounting domain, emphasize that Artificial Intelligence (AI) not only expedites routine accounting tasks but also facilitates nuanced data analysis. Leveraging AI technology results in heightened accuracy of financial reporting and expedited analysis of financial trends. Deloitte acknowledges Artificial Intelligence's pivotal role in the digital transformation of the accounting sector. This recognition is that AI-driven assistance expedites the audit process through automated data collection and analysis, thus reducing human errors and enhancing operational efficiency.

Within the realm of public accounting, *Machine Learning* stands out as a particularly beneficial form of AI, aiding accountants in their endeavors.

### 2.3.1 Data Automation

*Machine Learning* proves highly effective in expediting the aggregation and analysis of the intricate and extensive datasets, thereby diminishing the necessity for human intervention and elevating the precision of outcomes. Within the realm of public accounting, this translates into heightened celerity in managing financial transactions and inputting data into systems. Deloitte underscores that AI markedly bolsters productivity and operational efficiency across enterprises. By automating data processes, *Machine Learning* yields significant time savings and enhances the accuracy of financial transactions recording. This, in turn, streamlines repetitive tasks and liberates professionals to concentrate on strategic analysis and decision-making endeavors intimately linked with augmenting operational efficiency within companies.

## 2.3.2 Fraud Detection

*Machine Learning* proves immensely valuable in identifying anomalous patterns indicative of potential fraud or financial misconduct. Through its capacity to recognize early warning signs, this system enables proactive measures or expeditious investigations. *Machine Learning* offers advanced capabilities in fraud detection, a critical aspect for upholding financial integrity and regulatory compliance in public accounting. Deloitte underscores the imperative for companies to adopt cutting-edge technology to fortify their security and oversight mechanisms. By leveraging *Machine Learning* algorithms trained to discern patterns and deviations from historical data, organizations not only pinpoint fraud risks but also facilitate timely interventions and inquiries. This, in turn, bolsters risk management practices and instills confidence among stakeholders, thereby safeguarding the company's reputation and performance.

# 2.3.3 Predictive Modeling

*Machine Learning* is employed to develop financial forecasts and risk management models, assisting public accountants in devising more efficient financial plans and risk mitigation strategies. By delivering precise predictions, *Machine Learning* supports the processes of financial planning and risk management. Deloitte underscores that AI offers indispensable insights for informed decision-making based on data. Within public accounting, predictive models are constructed through *Machine Learning* aid in projecting financial trends, empowering accountants and decision-makers to proactively allocate resources and address potential risks. The integration of AI into predictive modeling reinforces companies strategic position by enhancing their capacity for data-driven planning and decision-making.

In essence, the advantages conferred by *Machine Learning* underscore its alignment with Deloitte's viewpoint on the pivotal role of AI in enhancing corporate performance. Within the realm of public accounting, *Machine Learning* not only expedites processes and enhances accuracy but also contributes to risk mitigation and fortifies financial planning, thus bolstering the argument that AI is a critical determinant of corporate success.

# 3. What Young Accountants should Prepare

With the functions of various types of AI and the impact on accounting from the emergence of AI, according to previous research, the step that must be taken is to improve one's abilities because with the emergence of AI, the role of the accounting profession is required to have much higher work professionalism. According to the American Institute of Certified Public Accountants (AICPA), the accounting profession will experience changes in its role due to very rapid technological developments (Setiawan, 2019). Now the role of the accounting profession is not only to provide financial information data, calculate company taxes, or record transactions, but the role of accountants in the future will be much more than that, even technology can take over that role. Other research results say

that the role of accountants in the future includes; Tax Consultant, Financial Analyst, Financial Planner, and Public Accountant (UMSU, 2023).

With changes in the role of accounting in the future, accountants must have a future strategy to face changes in the role of the accounting profession by increasing their ability to use technology, understanding more about taxes and audits related to accounting and must have a good attitude. If young accountants cannot prepare strategies to overcome the challenges of AI technology, then the positive impact that will make it easier to use AI in the work process will be the accounting profession will be a threat to the loss of the role of an accountant. Accountants must be able to respond to technological advances in the form of AI by developing skills that are far more professional than the skills of the accounting profession in the past.

### CONCLUSIONS

In the current era of information technology disruption, the development of AI or what is known as AI has become increasingly numerous, each of which has its own benefits. The existence of AI provides convenience and efficiency in accounting, and has a big impact on replacing the role of the financial accounting, management accounting and public accounting professions. Young accountants must equip themselves with readiness and strategies, including a comprehensive understanding of technology, enhanced knowledge in taxation and audit areas relevant to accounting, and the cultivation of a positive attitude. These measures are essential for ensuring the longevity and relevance of the accounting profession amidst the technological disruptions of today's era.

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