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Artificial Intelligence in Accounting, Auditing and Finance

A Guide for Implementation and Use

Springer

Contributions to Finance and Accounting

Michael Adelowotan • Collins Achepsah Leke
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Preface

This book provides a comprehensive examination of how Artificial Intelligence (AI) is transforming accounting, auditing, and finance. Each chapter explores a specific aspect of this transformation, offering both theoretical insights and practical guidance for professionals and organisations navigating this changing landscape.

The chapters are organised to provide a logical progression from foundational concepts to specific applications, including:

- Theoretical frameworks for understanding AI in finance
- Technical aspects of AI implementation
- Practical applications across different domains
- Future trends and emerging possibilities and
- Case studies and real-world examples

Whether you are a practicing professional, an academic researcher, or a student preparing for a career in financial services, this book will help you understand the opportunities and challenges that AI presents and how to prepare for the future of finance.

As we begin this exploration, remember that the integration of AI into financial services is not just about technology—it is about how we can use these new capabilities to create better outcomes for organisations, professionals, and society. The chapters that follow will guide you through this transformation, providing the knowledge and insights you need to succeed in an AI-enabled financial world.

This book represents a collaborative effort to capture the state of the art in AI applications across financial services while looking ahead to future possibilities. Through detailed analysis, case studies, and expert perspectives, we aim to provide a comprehensive resource for understanding and navigating this rapidly evolving landscape.

The second chapter explores the development of Artificial Intelligence and Machine Learning with emphasis on the applications in the financial services sector. The third chapter also discusses the development of Accounting as a service activity.

The fourth chapter explores the challenges of Artificial Intelligence and the Fourth Industrial Revolution to the accountancy profession. The fifth chapter also

emphasises the impact of Artificial Intelligence on the role of management accountants.

The sixth chapter discusses the impact of Artificial Intelligence on Auditing and Assurance Services while the seventh chapter explores the integration of artificial intelligence into taxation processes.

The eighth chapter reflects on Artificial Intelligence and Financial Statement Analysis by using a critical management framework approach while the ninth chapter presents Artificial Intelligence Tools and Use Cases in Corporate Finance.

The tenth chapter discusses the benefits and challenges of utilising Artificial Intelligence in Enterprise Risk Management while the eleventh chapter presents Financial Time Series Forecasting in the Artificial Intelligence domain.

The twelfth and the concluding chapter reflects on the centrality of data as the new currency of our remade world.

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Introduction: Our Remade World

Michael Adelowotan and Collins Achepsah Leke

Abstract This chapter lays a foundation for the book by sensitising the readers on the advent of the Fourth Industrial Revolution (4IR) technologies with their attendant technological advances. Today's world could be termed as a remade world because of the effect of the unparalleled technological disruptions of the 4IR.

The chapter identified the various stages in the evolution of technologies as it relates to the financial services industry. From manual to computerised bookkeeping and to the advent of Enterprise Resource Planning (ERP) systems in the 1990s. This was followed by the era of cloud-based financial services in the 2000s and finally by the current Artificial Intelligence revolution which largely characterised the 4IR age.

The chapter emphasised that AI Revolution in Financial Services is evident in such areas as data processing and analysis, automation and decision support as well as customer service and experience to mention a few. The confluence of AI technology with other technologies such as the blockchain and distributed ledger technology has brought in new possibilities for decentralising finance, enhanced traceability, and transparency of transactions.

The chapter concludes that the advent of these technologies has the capability to reshape the accounting, auditing, and finance functions by reshaping traditional practices thus creating new possibilities in terms of processes, human skills, and output.

Keywords Evolution · Technologies · Accounting · Auditing and finance

A remade world is here. Thanks to the transition to the Fourth Industrial Revolution (4IR), characterised by unparalleled technological advances, the way day-to-day operations and tasks are performed has become more efficient, effective, accurate, and timeous. These technological advances have produced super smart phones, driverless cars, and robotic factories with the aid of machines capable of teaching

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and doing cognitive tasks which are hitherto carried out by humans. The consequence of this development is that tasks that hitherto require human intelligence can now be performed by intelligent machines.

In view of this technological advancement in the world today, individuals, corporations, professions, and countries are being challenged to rise to the reality of today's 'remade world'. The initial vision of these technological advances should not only be confined to the Silicon Valley in the United States, and the smart factories in China, but should spread to other continents particularly Africa for which the 4IR is providing a great opportunity to level up with the technologically advanced countries in the American, Asian, and European continents.

The effect of the technological disruptions occasioned by the 4IR could be seen in the attempts of world powers to harness the gains for their national, political, and diplomatic interests. According to the Washington Post, the result is a new bipolar world based on technology rather than nuclear arsenals.

Another important point to note here is that the 'technological disruptions' of the age of Artificial Intelligence (AI) and the 4IR have brought fears of job losses to virtually all professions. Job losses in millions are inevitable but again job creations in millions are also inevitable. AI and Automation will succeed in destroying many jobs that hitherto require some level of human intelligence while jobs that require a greater level of human intelligence will remain relevant. These jobs will complement and control the jobs that have been overtaken by machine learning (ML) and the AI.

It is expected that each profession must recognise the need to develop as a matter of urgency training programmes and acquisition of skills relevant to completing and controlling the jobs overtaken by technological advancements. It is hoped that the professionals of today will be enabled to make smarter and faster decisions with these new technologies.

The World Economic Forum Technology Tipping Points and Societal Impact Report identified the following as the technology tipping points that may occur by the year 2025:

- 10% of people wearing clothes connected to the internet,
- The first Robotic pharmacist in the USA,
- The first 3D-printed car in production,
- 5% of consumer products printed in 3D,
- 90% of the population with regular access to the internet,
- Driverless cars equalling 10% of all cars on US roads,
- The first transplant of a 3D-printed liver,
- Over 50% of internet traffic to homes for appliances and devices,
- The first city with more than 50,000 people with no traffic lights, and
- The first AI machine on a corporate board of directors.

In the 4IR, a remade world consisting of smart factories, campuses, communities, cities, and countries is here.

The dawn of artificial intelligence (AI) marks a transformative era in the fields of accounting, auditing, and finance. As we stand at the intersection of technological

innovation and traditional financial practices, the integration of AI is not merely an evolution but a revolution that is fundamentally reshaping how financial professionals work, how businesses operate, and how value is created and measured in the global economy (Kokina and Davenport 2017; Borin and Mancini 2019). This transformation comes at a critical juncture, as organisations worldwide grapple with increasing complexity, regulatory scrutiny, and the need for more sophisticated decision-making tools (Maaitah 2023).

The convergence of big data, advanced analytics, and machine learning has created unprecedented opportunities for innovation in financial services (Paramesha et al. 2024). From automated bookkeeping systems that can process thousands of transactions per second to sophisticated fraud detection algorithms that can identify subtle patterns of suspicious activity, AI is redefining what is possible in the financial domain (Agarwal 2019; Kumar 2024). This technological revolution is occurring against a backdrop of global economic changes, including the rise of digital currencies, the growing importance of environmental, social, and governance (ESG) factors, and the increasing interconnectedness of global financial markets (Galeone et al. 2024).

1   Historical Context and Evolution

Before delving into the current state and future possibilities of AI in finance, it is crucial to understand the historical context that has led us to this point. The financial services industry has undergone several major transformations throughout history, these being (Gomber et al. 2018):

1. The transition from manual to computerised bookkeeping in the mid-twentieth century (Hoffman and Friedman 2018),
2. The advent of enterprise resource planning (ERP) systems in the 1990s (Katuu 2020),
3. The shift to cloud-based financial services in the early 2000s (Misra and Doneria 2018), and
4. The current AI revolution, which began in earnest in the 2010s (Elliott 2019).

Each of these transitions has brought its own challenges and opportunities, but the current AI revolution represents a fundamental shift in how financial information is processed, analysed, and used for decision-making (Elliott 2019; Dwivedi et al. 2021). Unlike previous technological advances that primarily automated routine tasks, AI systems can analyse complex patterns, make sophisticated judgements, and learn from experience in ways that more closely mirror human cognitive processes (Sun and Vasarhelyi 2018).

2   The AI Revolution in Financial Services

The financial services sector has historically been at the forefront of technological adoption, from the first computerised accounting systems to modern cloud-based financial platforms (Javaid et al. 2022; George 2024). Research by Flavián et al. (2022) indicates that AI adoption in financial services has grown by 37% annually since 2019. This transformation is particularly evident in several key areas, like:

3   Data Processing and Analysis

- Real-time processing of vast amounts of structured and unstructured data (Azad et al. 2020),
- Advanced pattern recognition and anomaly detection (Lee et al. 2022),
- Natural language processing for document analysis and communication (Pandey and Pandey 2019), and.
- Automated report generation and insight extraction (Brath and Hagerman 2021).

4   Decision Support and Automation

- AI-driven risk assessment and management,
- Automated trading and portfolio management,
- Intelligent process automation for routine tasks, and
- Predictive analytics for business planning and forecasting.

5   Customer Service and Experience

- Chatbots and virtual assistants for customer support,
- Personalised financial advice and recommendations,
- Automated onboarding and KYC processes, and
- Enhanced fraud detection and security measures.

The impact is being felt across every aspect of financial services, from retail banking to investment management, and from corporate finance to regulatory compliance. This widespread adoption is driving fundamental changes in how financial institutions operate and compete.

6 The Confluence of Technologies

The power of AI in financial services is amplified by its integration with other emerging technologies, such as blockchain and distributed ledger technology, which has resulted in enhanced transparency and traceability of transactions, smart contracts for automated compliance, improved audit trails and verification processes, and new possibilities for decentralised finance (DeFi). Furthermore, with the Internet of Things (IoT) there is real-time data collection for risk assessment, enhanced asset tracking and management, automated inventory and supply chain finance, and improved insurance underwriting through IoT data. With Cloud Computing, being one of the technologies with applicability in finance as well, there is the possibility of achieving scalable computing resources for AI applications, enhanced data storage and processing capabilities, improved accessibility and collaboration, and cost-effective deployment of AI solutions. Finally, with 5G and Edge Computing, the result will be real-time processing of financial transactions, enhanced mobile banking capabilities, improved security through distributed processing, and new possibilities for location-based financial services.

7 Transforming the Accounting Profession

The accounting profession stands at a crucial juncture as AI technologies reshape traditional practices and create new possibilities. Rather than replacing accountants, AI is augmenting their capabilities and allowing them to focus on higher-value activities. This transformation is occurring across several dimensions, for example, in Automation and Efficiency where there are automated data entry and reconciliation, real-time financial close processes, continuous accounting and reporting, and enhanced accuracy and reduced errors. Also, it will occur in Advanced Analytics, which will result in sophisticated financial analysis and modelling, predictive analytics for business planning, real-time performance monitoring, and enhanced decision support capabilities. Furthermore, there will be transformations in Professional Development with the evolution of skill requirements, new roles and responsibilities created, enhanced advisory capabilities proliferated, and the integration of technical and business expertise made possible.

These changes represent a fundamental shift in how accounting professionals work and the value they provide to organisations. The role of accountants is evolving from traditional bookkeeping and compliance functions to strategic advisory positions that leverage AI-enhanced insights for better decision-making.

8 The Human Element

Despite the transformative power of AI, the human element remains crucial in financial services. The successful integration of AI requires that there be a cultural transformation necessitating the building of AI literacy across organisations, the developing of new working models, the managing of change and resistance, and the creating of collaborative human-AI environments. In addition, ethical considerations are of importance like ensuring fairness and avoiding bias, maintaining privacy and security, building trust and transparency, and balancing automation with human judgment. It goes without saying that skills development will be of utmost importance with the following to be considered with a high degree of urgency: Technical training and education, Soft skills enhancement, Cross-functional collaboration, and Continuous learning and adaptation.

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