The History of Accounting and the Revolution of Accounting Activities: Literature Review

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ABSTRACT

Accounting has faced numerous challenges throughout its evolution, including resistance to standardization, gaps between theory and practice, and the need to adapt to rapidly changing technological environments. Understanding the historical development of accounting and contemporary transformations is essential for appreciating the profession's role in modern business. This literature review traces accounting's evolution through its various stages of development, examines the foundational debates about its origins, and analyzes the revolutionary changes currently reshaping the profession in the digital era.

The review further explores the current dual revolution reshaping accounting: the global harmonization of financial and ESG reporting standards alongside technological disruptions driven by artificial intelligence, blockchain, and real-time data analytics. These forces are transforming accounting activities from manual processes to data-centric advisory roles, creating new skill demands and regulatory challenges. The integration of explanatory theories such as agency, legitimacy, stakeholder, and institutional theory provides a robust framework for understanding both historic developments and contemporary shifts. The review concludes with recommendations for education, professional practice, and standard-setting to address emerging complexities and ensure accounting's continued relevance in a digital, globalized economy.

Keywords: History of accounting, Evolution of accounting, Accounting practices, Bookkeeping systems, Double-entry bookkeeping, Luca Pacioli

INTRODUCTION

Accounting has its roots in ancient civilizations, where early accounting systems first emerged. The ancient Egyptians and Babylonians in Mesopotamia were among the earliest to develop accounting, alongside advances in writing, counting, and the use of money. These civilizations utilized accounting to manage agricultural production, trade, and taxation (Chanakya's financial management writings in India further demonstrate the early development of such systems) (Acca Global, 2007; Persson, 2023; Finansys, 2024). The Roman Empire showcased the advanced development of accounting procedures by accessing complete financial data across time, which aided in governance and fiscal management. In India under the Mauryan Empire, texts such as the Natyashastra authored by Chanakya provide detailed descriptions on maintaining financial records for sovereign states (Persson, 2023).

History of Accounting

The formalization of accounting as a profession began in the Italian Renaissance period with Luca Pacioli, who is credited as the "Father of Accounting and Bookkeeping" for his treatise that introduced double-entry bookkeeping in 1494 (Maryville University, 2024). This method, balancing debits and credits, revolutionized

accounting by providing a clearer and more error-resilient financial picture. Scotland is recognized as the birthplace of the modern profession of chartered accounting in the 19th century, where accountants often belonged to legal societies, reflecting the close relationship between law and accounting services (ACCA Global, 2007; Maryville University, 2024).

The 19th century also witnessed the consolidation of accounting professional bodies, culminating in the foundation of the Institute of Chartered Accountants in England and Wales in 1880. This professionalization was accompanied by early forensic accounting traits within accounting practices, laying the groundwork for contemporary specialized accounting services (Persson, 2023; Maryville University, 2024).

In recent decades, accounting history has increasingly gained prominence as a formal field of inquiry. This growth is attributed not only to the accumulation of knowledge but also to scholars' efforts to document accounting's evolution rigorously. Recent advances challenge earlier beliefs of straightforward evolution and progress, placing greater emphasis on the underlying language, logic, and societal influences within accounting knowledge. The focus has shifted from fixed roles such as the bookkeeper or decision-maker to a broader view that considers extensive changes in accounting knowledge and practices (McBride, 2025; Persson, 2023).

The Pacioli-Cotrugli Controversy

The question of who should be credited as the "father of accounting" has generated considerable scholarly debate, particularly regarding the contributions of Luca Pacioli and Benedetto Cotrugli. Luca Pacioli, a Franciscan friar, is widely credited with publishing the first printed exposition of double-entry bookkeeping in 1494 through his monumental work "Summa de Arithmetica, Geometria, Proportioni et Proportionalita" (Sangster, 2021). However, historical evidence suggests that Benedetto Cotrugli introduced double-entry bookkeeping approximately thirty years before Pacioli (Sangster, 2018).

Despite Cotrugli's earlier contribution, Pacioli has achieved greater recognition in accounting history for several reasons. First, Pacioli's work was the first printed exposition of double-entry bookkeeping, which gave it vastly greater circulation and influence than Cotrugli's manuscript (Sangster, 2021). The advent of the printing press meant that Pacioli's treatise could reach a far broader audience of merchants, accountants, and scholars across Europe and beyond. Second, Pacioli's detailed and systematic presentation of the accounting method provided a more comprehensive framework for understanding and implementing double-entry bookkeeping compared to earlier descriptions (Sangster, 2018). Third, Pacioli's work became the foundation for subsequent accounting textbooks and manuals, establishing a direct lineage of accounting thought that could be traced to his contributions (Coate et al., 2020).

The significance of this debate extends beyond mere attribution of priority. It reflects fundamental questions about what constitutes a scholarly contribution: Is priority of discovery the determining factor, or does the systematic organization and wide dissemination of knowledge matter more? Pacioli's selection as the acknowledged founder of accounting demonstrates the historical importance of both originating innovations and effectively communicating them to a broad audience (Coate et al., 2020). His work was revolutionary not because he invented double-entry bookkeeping, but because he made it accessible, understandable, and implementable for merchants and accountants throughout the Mediterranean world and beyond (Al-Adeem, 2022).

Definition

Accounting has been defined in multiple ways reflecting its evolving nature and multifaceted applications.

Broadly speaking, accounting is the process of identifying, measuring, and communicating financial and nonfinancial information about economic entities to stakeholders, enabling them to make informed decisions (Jankalov & Jankal, 2024).

In the context of Society 5.0 and digital transformation, accounting is increasingly understood as a sophisticated information system that processes complex datasets to provide insights into organizational performance,

sustainability impacts, and stakeholder accountability (Jasmaulani & Rahayu, 2024). The discipline encompasses financial accounting, which focuses on external reporting to investors and creditors; management accounting, which provides internal decision-making information; and increasingly, sustainability accounting, which measures and reports environmental, social, and governance impacts (Jankalov & Jankal, 2024).

Professional Terminology: The Evolution of Accountant Titles

Throughout history, accounting professionals have been known by various titles reflecting the evolving nature of their work and responsibilities:

Chartered Accountants emerged in the 19th century, particularly in the United Kingdom, representing professionals who had completed formal training and obtained certification from professional bodies (Murphy, 2018). These individuals combined technical accounting knowledge with business acumen and ethical standards.

Certified Public Accountants (CPAs) developed in the United States during the early 20th century, representing a standardized professional qualification that required passing rigorous examinations and meeting educational requirements (Murphy, 2018). This credential became a global standard for accounting professionals.

Statutory Auditors became necessary with the growth of joint-stock companies and the need for independent verification of financial statements. These professionals serve a regulatory function, ensuring compliance with accounting standards and detecting fraud (Paape, 2007). Their role has expanded significantly with corporate governance reforms, particularly following major accounting scandals.

Financial Advisors represent a broader category of professionals who combine accounting knowledge with investment and business advisory services. They help organizations and individuals make strategic financial decisions based on comprehensive accounting analysis.

Forensic Accountants have emerged as a specialized category of professionals trained to investigate financial fraud, embezzlement, and other financial crimes (Huamn et al., 2025). Their expertise combines accounting knowledge with investigative techniques and legal understanding, making them essential in litigation support and fraud detection.

Financial Engineers represent a newer category of professionals who apply advanced mathematical and computational techniques to financial analysis and accounting. These professionals use sophisticated models and algorithms to analyze complex financial data and develop innovative financial solutions (Deliu & Olariu, 2024). Their emergence reflects the increasing role of technology and quantitative analysis in accounting practice.

The Concept of Accounting

Accounting functions as both a technical discipline and a social practice. As a technical discipline, it provides standardized methods for recording, classifying, and summarizing financial transactions (Koval & Tomchuk, 2024). As a social practice, accounting serves broader purposes in organizational accountability, democratic governance, and social responsibility (Jankalov & Jankal, 2024).

The conceptualization of accounting has evolved significantly in recent years. Contemporary understanding recognizes accounting not merely as a mechanical recording system but as a sophisticated information technology that shapes organizational behavior, influences stakeholder decisions, and contributes to societal wellbeing (Lestari et al., 2025). The digital revolution has transformed accounting from primarily a manual record-keeping function to an advanced analytical and decision-support system (Nguyen, 2025).

Importantly, recent scholarship emphasizes accounting's role in sustainability and corporate social responsibility. Accounting is now understood as encompassing environmental and social dimensions alongside traditional financial measurement (Jankalov & Jankal, 2024). This expanded conception reflects growing recognition that organizations must account for their impacts on multiple stakeholders and the natural environment, not merely their financial performance to investors.

Comparative matrix (recent reviews 2021–2025)

Dimension	Accounting history/historiography	Revolution of accounting services
Typical scope	Theories, sources, writing; digital archives; field evolution across decades	Digital accounting, AI/ML, blockchain, ESG standard setting, practice, and service transformation
Methods	Agenda essays; empirical reflections; RPYS/algorithmic historiography; bibliometrics; structured reviews	SLRs; bibliometrics; mixed-method surveys/PLS-SEM; fuzzy AHP; conceptual/technical reviews
Core findings	Methodological pluralism; digitization changes how history is done; diverse regional trajectories	Performance links (context-sensitive); AI/ML emerging in MA/audit; blockchain potential and limits; ESG standard-setting shift
Frictions	Avoid scholasticism; maintain empirical richness and reflexivity	Skills gaps, governance/ethics, cybersecurity, regulation; tension between standardization and narrative
Future needs	Cross-disciplinary methods; digital source critique; inclusive geographies	Longitudinal transformation cases; assurance frameworks for AI/BT/ESG; integration of standards, tech, and professional judgement

Explanatory theories in accounting

A large share of empirical accounting research explains reporting choices and disclosure practices through a small set of theories. Syntheses of recent literature on corporate ESG/CSR disclosure consistently identify stakeholder theory, legitimacy theory, institutional theory, and agency theory as dominant explanatory frameworks, often used in combination to capture different drivers of accounting behavior (Gesso & Lodhi, 2024).

Positive Accounting Theory

Positive Accounting Theory (PAT) emerged in the 1980s through the work of Ross Watts and Jerold Zimmerman, representing a fundamental shift in accounting research methodology and orientation (Utari et al., 2023). PAT is built on the assumption that accounting practice can be explained through economic incentives and rational self-interest (Utari et al., 2023). The theory posits that managers and other stakeholders choose accounting policies based on how those choices affect their personal welfare, particularly through compensation mechanisms, debt covenants, and political costs (Wiratama & Asri, 2020).

PAT identifies three main explanations for accounting choices: (1) the bonus plan hypothesis, which suggests managers select accounting methods to maximize their compensation; (2) the debt covenant hypothesis, which explains that highly leveraged firms choose accounting methods to avoid violating debt agreements; and (3) the political cost hypothesis, which suggests that large firms adopt accounting policies to minimize political scrutiny and reduce the likelihood of regulation (Utari et al., 2023). PAT has profoundly influenced professional accounting practice by providing a framework for understanding why firms make particular accounting choices. This theory helps explain observed differences in accounting policies across organizations and industries (Zhafir & Subroto, 2024). However, PAT has been criticized for its methodological limitations and its narrow focus on economic incentives without adequately considering ethical dimensions or the broader social implications of accounting choices (Zhafir & Subroto, 2024).

Normative Accounting Theory

Normative Accounting Theory (NAT) developed earlier than PAT, with roots extending back to the 1960s and earlier. It represents a prescriptive approach asking what accounting should do rather than what it does (SovannahPhengsavang, 2024). NAT assumes that accounting should serve broader societal purposes beyond merely maximizing shareholder wealth (SovannahPhengsavang, 2024). The theory emphasizes ethical principles, fairness, and the accountability that organizations owe to multiple stakeholders including employees,

customers, creditors, and the broader society (SovannahPhengsavang, 2024). NAT is grounded in philosophical and ethical traditions that emphasize justice, transparency, and stakeholder welfare. It argues that accounting standards and practices should be designed to promote equitable outcomes and protect vulnerable stakeholders (SovannahPhengsavang, 2024).

NAT influences professional accounting through emphasis on ethical codes of conduct, audit standards designed to protect public interest, and accounting principles oriented toward fair presentation of financial position (Sharma, 2013). The theory underpins professional accounting bodies' emphasis on integrity, objectivity, and due care as fundamental principles (SovannahPhengsavang, 2024). However, contemporary research reveals gaps between NAT aspirations and actual accounting practice, particularly regarding stakeholder inclusion in standard-setting and the materialization of social and environmental accounting (SovannahPhengsavang, 2024).

Accountability Theory

Accountability Theory developed from institutional and agency theory foundations, gaining prominence particularly in public sector accounting literature from the 1990s onward (Narulitasari et al., 2023). Accountability Theory is based on the principle that organizations receiving resources or authority from stakeholders must provide an accounting (literally, an "account") of their stewardship (Syah et al., 2025). The theory assumes that accountability relationships are fundamental to organizational legitimacy and social order (Haustein et al., 2024).

The theory identifies multiple dimensions of accountability: financial accountability (accurate reporting of resource use), performance accountability (demonstration that objectives were achieved), and democratic accountability (responsiveness to stakeholder interests and participation in decision-making) (Tran et al., 2021). Accountability Theory directly shapes professional auditing standards, financial reporting frameworks, and audit committee functions (Narulitasari et al., 2023). It provides the theoretical justification for mandatory financial reporting, external audits, and transparency requirements (Syah et al., 2025). The theory has particular relevance in public sector accounting, where accountability to citizens and elected representatives is paramount (Tran et al., 2021). Contemporary developments in corporate governance, including expanded board audit committees and increased external audit requirements, reflect accountability theory principles (Paape, 2007).

The Importance of Accounting

Accounting serves multiple critical functions in modern economies and organizations. At the organizational level, accounting provides essential information for managerial decision-making, internal control, and performance evaluation (Jankalov & Jankal, 2024). Financial reports prepared according to accounting standards enable investors to assess organizational performance and make investment decisions (Billi & Bernardo, 2025).

Beyond organizational functions, accounting contributes significantly to macroeconomic stability and efficient capital allocation (Jankalov & Jankal, 2024). Well-functioning accounting systems facilitate the flow of capital to productive uses, enable creditors to monitor debt obligations, and support government fiscal management (Shepeliuk, 2025).

Increasingly, accounting is recognized as essential to achieving sustainable development goals (Jankalov & Jankal, 2024). Accounting frameworks that measure and report environmental and social impacts enable organizations and governments to track progress toward sustainability objectives (Nyakuwanika & Panicker, 2025). The evolution toward integrated reporting, combining financial, social, and environmental disclosures, reflects growing recognition that accounting must address the full spectrum of organizational impacts on stakeholders and society (Jankalov & Jankal, 2024).

Why accounting is important

1. Decision usefulness and stewardship

Accounting turns transactions and operations into decision-ready information that guides resource allocation, performance evaluation, and control, strengthening stewardship over assets and obligations. It also embeds

organizations within social systems by making activities visible and governable to multiple audiences. (Edwards & Walker, 2020) (Arnaboldi et al., 2017) (Bonsn & Bednrov, 2019)

2. Accountability, governance, and legitimacy (including sustainability)

Financial and non-financial reporting (e.g., ESG) reduces information asymmetry, supports governance, and helps organizations meet stakeholder expectations and maintain their social license, especially as disclosure practices institutionalize across markets and jurisdictions. (Gesso & Lodhi, 2024) (Qian et al., 2021) (Narayan & Oru, 2024)

3. Performance, risk management, and value creation in the digital economy

Digital accounting capabilities and analytics are linked to better organizational performance and competitiveness, enabling faster decisions, sharper risk sensing, and more agile services; this raises skill requirements and shifts accountants toward data-centric advisory roles. (AlOkaily et al., 2023) (Odonkor et al., 2024) (AlHtaybat et al., 2018)

4. Trust, comparability, and market integrity

Standards and assurance underpin investor trust and capital market efficiency, while new infrastructures (e.g., distributed ledgers) promise transparency but still require professional judgment, governance, and audit innovation to safeguard reliability and mitigate emerging risks (e.g., cybersecurity, bias, fraud). (Villiers & Dimes, 2022) (Maffei et al., 2021) (Supriadi, 2024)

The Revolution of Accounting Activities and Accounting Standards

The accounting profession is undergoing a dual revolution: one driven by the global harmonization and evolution of accounting standards, and another driven by digital transformation and technological disruption. Together, these forces are fundamentally reshaping what accountants do and how organizations report economic reality.

Part I: Revolution in Accounting Standards

Global harmonization and IFRS convergence

The movement toward global accounting harmonization emerged from recognition that international capital flows and multinational enterprises required comparable financial reporting across jurisdictions (Siregar et al., 2025). For decades, accounting standards varied significantly across countries, reflecting different legal systems, taxation approaches, and economic philosophies. This variation created challenges for international investors attempting to compare financial statements of companies across different countries (Meena et al., 2025).

IFRS Convergence: Progress and Challenges

The International Financial Reporting Standards (IFRS), developed by the International Accounting Standards Board (IASB), have become the dominant framework for global accounting standardization (Meena et al., 2025). Over 140 countries have either required or permitted IFRS adoption for listed companies, representing a remarkable convergence toward uniform accounting practices (Meena et al., 2025).

Benefits of Convergence: Research demonstrates that IFRS adoption has increased transparency, improved comparability of financial statements across countries, and enhanced the value relevance of accounting information to capital markets (Siregar et al., 2025). Companies adopting IFRS have reported improved access to international capital, reduced compliance costs through eliminating multiple reporting standards, and enhanced stakeholder confidence (Siregar et al., 2025).

Implementation Challenges: Despite broad IFRS adoption, significant implementation challenges persist (Alghazzawi, 2025). The principles-based nature of IFRS requires interpretation and professional judgment, leading to variations in application across jurisdictions and firms (Siregar et al., 2025). Furthermore, IFRS convergence does not guarantee consistency in enforcement, and differences in audit quality and regulatory

oversight create divergence despite nominally adopting the same standards (Alghazzawi, 2025). Additionally, some countries have adopted modified versions of IFRS, creating complexity for international comparisons (Meena et al., 2025).

Emerging Issues in Accounting Standards Evolution

Recent developments in accounting standards address previously under-regulated areas. The sustainability accounting standards issued by the International Sustainability Standards Board (ISSB), including IFRS S1 and S2, represent a significant evolution in mandating sustainability disclosure (Szychta et al., 2024). These standards acknowledge that financial performance cannot be isolated from environmental, social, and governance impacts (Szychta et al., 2024).

The integration of double materiality concepts into sustainability standards represents a theoretical and practical advance (Szychta et al., 2024). Double materiality recognizes that some matters are material because they affect financial performance (financial materiality) while others are material because they reflect organizational impact on society and environment (impact materiality) (Szychta et al., 2024). This framework acknowledges that accounting must address broader stakeholder concerns than traditional financial materiality considerations.

Outcomes of IFRS convergence

Empirical evidence shows that IFRS convergence has improved accounting information quality in several dimensions. Post-convergence studies document increases in risk disclosure quantity and coverage in financial reports, decreased discretionary accruals (earnings management), and improvements in value relevance of earnings, though effects vary by country and governance strength (R. et al., 2023), (Gomes & Costa, 2024). In India, for example, IFRS convergence (through Indian Accounting Standards, Ind-AS) improved financial reporting quality and reduced management opportunism (Costa & Gomes, 2022; Khan & Sangmi, 2024).

Yet convergence brings implementation challenges. Indonesia's experience illustrates persistent obstacles: fair value accounting (replacing historical cost), the need for professional judgment, limited resources in SMEs, and cultural and regulatory barriers to adoption (Syahrani et al., 2025). Fair value measurement, a cornerstone principle shift under IFRS, requires more estimation and judgment than traditional book value approaches (Maulidah et al., 2024). Similarly, Brazil and Portugal faced obstacles in upskilling accountants to work with principles-based rather than rules-based approaches, and needed harmonization of domestic legislation to support IFRS requirements (Santos & Vieira, 2024).

Standards evolution: From IFRS to ESG and governance-focused reporting

Beyond financial reporting, a new wave of standard-setting is emerging around environmental, social, and governance (ESG) disclosure and sustainability reporting. The International Sustainability Standards Board (ISSB) and various ESG frameworks are reshaping what organizations must measure and report (Villiers & Dimes, 2022). This shift represents a tension: while IFRS emphasizes principles-based comparability across jurisdictions, the proliferation of ESG standards and frameworks introduces complexity and potentially contradicts the goal of a single harmonized set of global standards (Villiers & Dimes, 2022).

Part II: Revolution in Accounting Activities (Digital Transformation)

From transaction processing to data-driven advisory

The technological revolution is fundamentally transforming how accounting activities are performed. The profession is evolving from manual, repetitive bookkeeping and record-keeping toward sophisticated, datadriven, strategic advisory roles. This shift is enabled by artificial intelligence, machine learning, robotic process automation (RPA), blockchain, cloud computing, and big data analytics (Judijanto et al., 2025; Kuaiber et al., 2024) (Ababneh, 2025).

Key technological impacts on accounting activities

1. Automation of routine tasks: AI and RPA are automating data entry, invoice processing, reconciliation, and payroll tasks. This automation improves accuracy and reduces human error, freeing accountants to

focus on analysis and strategic work (Judijanto et al., 2025; Kuaiber et al., 2024) (Ababneh, 2025). In financial reporting, AI-powered systems accelerate the reporting process and enhance timeliness (Kobanenko, 2025).

2. Enhanced detection and fraud prevention: Machine learning algorithms analyze vast datasets to identify anomalies, discrepancies, and fraudulent patterns in real time. AI-powered auditing systems enhance anomaly detection and improve the integrity of financial controls (Jejeniwa et al., 2024; Kobanenko, 2025). Blockchain technology offers the potential for immutable, transparent record-keeping and realtime audit trails, though regulatory and scalability challenges remain (Ajayi-Nifise et al., 2024), (Maffei et al., 2021).

3. Predictive analytics and decision support: ML models predict financial trends, costs, and cash flows with greater accuracy than traditional forecasting heuristics, enabling more informed strategic decisions (Jejeniwa et al., 2024; Groene & Zakharov, 2024). In management accounting, cost management systems are evolving from classical approaches to ecosystem-based, real-time management using IoT, big data, AI, and digital twins (2025).

4. Real-time, integrated reporting: Digital technologies enable continuous monitoring and reporting rather than periodic financial statements. Integrated performance systems combine financial and non-financial data (e.g., sustainability, human capital) for holistic decision-making (Arnaboldi et al., 2017; Zhu, 2023).

Skill requirements and workforce adaptation

The technological transformation is creating a significant skills gap. Accountants require new competencies: data analytics, basic programming, understanding of AI/ML, digital tool proficiency, and strategic thinking. However, accounting education continues to rely heavily on conventional methods, creating a mismatch between graduate skills and industry needs (Judijanto et al., 2025; Londoo-Cardozo, 2025; Stoenoiu & Jntschi, 2025).

Professional organizations, educational institutions, and industry must collaborate to retrain and upskill existing accountants while redesigning curricula to prepare new graduates for the digital era (Judijanto et al., 2025; Londoo-Cardozo, 2025; Razali et al., 2022). Resistance to change, concerns about job displacement, and cybersecurity risks are also barriers to adoption that require careful management (Odonkor et al., 2024; Ababneh, 2025).

Industry 4.0 and the accountant's evolving role

Within the broader context of Industry 4.0 (the fourth industrial revolution), accounting is undergoing a role recalibration. Traditionally, accountants performed compliance, control, and transaction recording functions. Under Industry 4.0, accountants are becoming strategic partners: analyzing real-time operational and financial data, supporting cost management and process optimization, and facilitating governance in complex, automated systems (Londoo-Cardozo, 2025), (Stoenoiu & Jntschi, 2025).

Machine learning in management accounting, for example, enables predictive cost analysis and resource optimization, but also requires governance frameworks to ensure algorithmic transparency and avoid bias (Smith & Lamprecht, 2024). Blockchain in accounting and auditing promises enhanced transparency and assurance, but adoption is conditioned on top management support, regulatory clarity, and addressing technical limitations (Jena, 2025).

Part III: Convergences and Tensions

Complementary transformations

The standards and activities revolutions are mutually reinforcing in some ways. Principles-based IFRS standards align with the flexibility required in digital environments, where real-time data and analytics support more judgment-based reporting. Similarly, non-financial (ESG) reporting standards create demand for new data collection and analysis capabilities that digital tools can provide (Alsulami, 2025; Nguyen et al., 2024).

Tensions and challenges

However, tensions also emerge. The proliferation of ESG standards complicates comparability (a core IFRS objective). The shift toward digital, automated reporting raises questions about the role of professional judgment

and audit independence. Data governance, cybersecurity, and algorithmic bias are new risks that standards and assurance frameworks are only beginning to address (Maffei et al., 2021; Thottoli, 2024). Finally, workforce displacement and the need for continuous upskilling create social and organizational challenges alongside technical ones (Londoo-Cardozo, 2025; Stoenoiu & Jntschi, 2025).

Summary Table: The Revolutions in Accounting

Dimension	Standards Revolution	Activities Revolution
Driver	Globalization, capital market harmonization, and ESG pressures	Automation, AI/ML, cloud, big data, Industry 4.0
Core change	Shift from local/rules-based to global/principles-based standards; then to integrated ESG reporting	Shift from manual, periodic to automated, real-time, data-driven processes
Key outcomes	Improved comparability and transparency, but complexity in ESG standard proliferation	Improved efficiency and accuracy, but skills gaps, cybersecurity risks, and job displacement concerns
Challenges	Implementation in diverse national contexts; fair value complexity; tension between standardization and narrative	Governance of AI/algorithms; data privacy; workforce adaptation; assurance of new technologies
Future direction	Toward integrated, non-financial + financial reporting; harmonization of ESG standards	Toward fully automated, integrated, realtime advisory systems; shift from compliance to strategic roles

The Role of Information and Communication Technology in Modern Accounting Practice

Digital Transformation of Accounting Functions

Information and Communication Technology (ICT) has fundamentally transformed accounting from predominantly manual, paper-based processes to highly automated, data-intensive systems (Koval & Tomchuk, 2024). Cloud computing, enterprise resource planning systems, and specialized accounting software now perform routine recording, classification, and summarization functions that historically required substantial manual effort (Koval & Tomchuk, 2024).

The application of advanced technologies, including artificial intelligence (AI), machine learning, and big data analytics, is revolutionizing accounting practice (Lestari et al., 2025). AI algorithms can now perform audit procedures, detect anomalies in financial data, and assess fraud risk at scales and speeds impossible for human auditors (Fedyk et al., 2022). Machine learning models improve predictive accuracy in revenue recognition, allowance estimation, and other accounting judgments (Lestari et al., 2025).

Benefits and Challenges of Technology Adoption

Benefits: Digital technologies have enhanced audit efficiency, enabling auditors to examine larger datasets more thoroughly (Fedyk et al., 2022). Real-time financial reporting systems provide management with current information for decision-making, rather than information delayed by manual accounting processes. Automation reduces processing errors and frees accounting professionals to focus on higher-value analytical and interpretive functions (Deliu & Olariu, 2024).

Challenges: Despite these benefits, significant challenges accompany technology adoption. Cybersecurity risks have increased substantially as accounting systems become more digitally connected and contain sensitive financial data (Morshed & Khrais, 2025). The digital divide—with varying levels of technology adoption across firms and nations—creates divergence in accounting quality and comparability (Nguyen, 2025). Additionally, the skills required of accounting professionals have shifted dramatically, with growing demands for digital literacy, data analysis capability, and systems understanding (Deliu & Olariu, 2024).

Challenges Of the Accounting Profession in Digital Economies and Digitalized Businesses

Cybersecurity And Data Protection

As accounting systems become increasingly digital and interconnected, cybersecurity has emerged as a paramount concern (Morshed & Khrais, 2025). Financial data, being of high value to criminals and competitors, presents attractive targets for cyber-attacks. Ransomware attacks on accounting systems can cripple organizational operations by rendering financial data inaccessible (Morshed & Khrais, 2025). Regulatory requirements for data protection, such as GDPR in Europe, impose substantial compliance obligations on accounting functions (Morshed & Khrais, 2025).

Skills Gap and Professional Development

A significant challenge facing the accounting profession is the skills gap between current capabilities and emerging technology requirements (Deliu & Olariu, 2024). Many practicing accountants received education emphasizing manual accounting processes, audit procedures, and financial statement analysis that assumed human-performed calculations. The transition to technology-driven practice requires new competencies in data analytics, systems administration, and emerging technologies (Deliu & Olariu, 2024). This gap creates both opportunities and threats: opportunities for accounting professionals who develop technology skills, but challenges for those unable or unwilling to adapt (Deliu & Olariu, 2024).

The Automation Paradox

The adoption of technology has created an interesting paradox in accounting employment (Fedyk et al., 2022). Research shows that firms investing substantially in AI and automation have experienced reductions in accounting staff within several years (Fedyk et al., 2022). However, this displacement has been partially offset by the creation of new roles—data analysts, systems administrators, and audit specialists who understand both accounting and technology (Fedyk et al., 2022). The profession faces the challenge of managing this transition effectively, ensuring that displaced accountants can transition to new roles rather than simply being eliminated from the workforce (Deliu & Olariu, 2024).

Standardization and Interoperability Challenges

Despite progress toward IFRS convergence, substantial standardization challenges persist in digital environments (Shepeliuk, 2025). Different accounting systems, cloud platforms, and data formats create interoperability challenges, making it difficult to integrate financial information across organizational units or with external stakeholders (Shepeliuk, 2025). XBRL (eXtensible Business Reporting Language) and other digital reporting formats are intended to address these challenges, but adoption remains inconsistent across jurisdictions and company sizes (Alghazzawi, 2025).

Blockchain and Distributed Ledger Technology

Emerging technologies like blockchain present both opportunities and challenges for accounting (Ivanova et al., 2024). Some accounting functions, particularly transaction recording and audit trails, could theoretically be enhanced through blockchain's immutability and transparency features (Ivanova et al., 2024). However, blockchain implementation raises questions about accounting's traditional concepts of balance sheets and period reporting, which may require reconceptualization in decentralized systems (Ivanova et al., 2024). Furthermore, blockchain's irreversibility creates challenges for accounting corrections and amendments, which are standard in current accounting practice (Ivanova et al., 2024).

Accounting Profession and The World of Research

Bibliometric Analysis of Accounting Research Evolution

Contemporary research on accounting history itself reveals interesting patterns in scholarly attention (Meena et al., 2025). A bibliometric analysis of accounting history publications from 2000-2023 identified 1,044 documents revealing the expanding scope and international reach of accounting history research (Rappazzo et al., 2024).

Key themes emerging from this research include the evolution of accounting standards, the role of professional associations, accounting's relationship to governance and accountability, and increasingly, the intersection of accounting with sustainability and digital transformation (Meena et al., 2025).

Gaps in Current Research

Several significant research gaps remain despite expanded scholarship (Meena et al., 2025). Regional variations in accounting development remain under-researched, with most attention focused on Western European and North American accounting history (Meena et al., 2025). Gender dimensions of accounting history have received increased attention recently but remain understudied relative to their importance (Meena et al., 2025). The intersection of accounting with emerging technologies, particularly AI and blockchain, requires substantial additional research to understand implications for the profession (Meena et al., 2025).

The Challenge of the Theory-Practice Gap

A persistent challenge in accounting research is the gap between academic theories and professional practice (Utari et al., 2023). Theories developed in academic settings often fail to influence accounting standards and practice, while practitioners sometimes resist academic insights as impractical (Zhafir & Subroto, 2024). Bridging this gap requires improved communication between academics and practitioners, recognition of legitimate perspectives from both communities, and research designs that address questions of practical significance (Coetsee, 2019).

CONCLUSION

Historical Development of Accounting

Accounting has evolved through distinct phases, each marked by technological and institutional milestones that reflect broader societal and economic transformations (Londoo-Cardozo, 2025; Chordia et al., 2025). From ancient civilizations in Mesopotamia and the Roman Empire, accounting systems emerged to support commerce and administrative control. The foundations laid in ancient India through texts like Kautilya's Arthashastra (4th century BCE) and later formalizations in medieval Europe demonstrate that accounting has long served as a mechanism for transparency, record-keeping, and governance (Chordia et al., 2025).

The most significant innovation—double-entry bookkeeping—emerged in medieval Italy, with Luca Pacioli's 1494 Treatise on Accounts and Records providing the foundational framework that persists today (Kulikova, 2023). This system established the fundamental principle that every transaction must be recorded from two perspectives, creating internal checks and enabling comprehensive financial visibility. For nearly 500 years, double-entry bookkeeping remained the technological core of accounting practice (Kulikova, 2023).

The 19th and 20th centuries witnessed the professionalization of accounting through the establishment of professional bodies, the standardization of practices, and the formalization of auditing and assurance functions. The accounting profession emerged not merely as a technical endeavor but as a gatekeeping mechanism ensuring transparency in capital markets and protecting public interest (Black et al., 2024).

Dual Revolution: Standards and Activities

The accounting discipline is currently experiencing a profound dual revolution that fundamentally reshapes both what accountants measure and communicate and how they perform their work.

Standards Revolution: The global shift toward International Financial Reporting Standards (IFRS) represents a coordinated effort to harmonize accounting practices across nations, facilitating capital market comparability and transparency (V, 2024). This convergence is not merely technical; it reflects institutional pressures to adopt principles-based, globally recognized standards that provide investors and stakeholders with reliable, comparable information (Syahrani et al., 2025). IFRS adoption has improved reporting quality and transparency in many jurisdictions, though implementation challenges persist, particularly in developing economies where capacity, regulatory alignment, and cultural factors constrain adoption (Bengtsson & Argento, 2023).

Beyond financial reporting, standards are expanding into environmental, social, and governance (ESG) domains. The emerging sustainability standards landscape reflects a paradigm shift: accounting is no longer confined to economic transactions, but extends to social and environmental impacts. However, this proliferation of ESG frameworks introduces complexity and threatens the comparability objective that IFRS sought to achieve (Villiers & Dimes, 2022).

Activities Revolution: Technological disruption—particularly artificial intelligence, machine learning, robotic process automation (RPA), cloud computing, and blockchain—is fundamentally transforming how accounting work is performed. Automation has shifted routine transaction-processing from human accountants to intelligent systems, freeing accountants to engage in analysis, advisory, and strategic roles (Judijanto et al., 2025), (Kuaiber et al., 2024), (Ababneh, 2025). Accountants are evolving from transaction processors into data analysts and strategic advisors, supporting organizations with predictive analytics, fraud detection, and real-time financial insights (Jejeniwa et al., 2024), (Kobanenko, 2025).

Skills Gap and Education Crisis

A critical tension emerges: while technological transformation creates demand for new skills (data analytics, AI literacy, digital tool proficiency, critical thinking), accounting education lags (Judijanto et al., 2025; LondooCardozo, 2025; Razali et al., 2022). Research shows that less than 5% of emerging technologies essential to the profession are taught in accounting curricula (Muthaiyah et al., 2021). This skills mismatch poses an existential challenge: graduates lack the competencies required by employers, while practitioners lack access to continuous upskilling opportunities (Londoo Cardozo, 2025; Stoenoiu & Jntschi, 2025).

Governance and Regulatory Challenges

As accounting practices become more complex and digitized, governance frameworks struggle to keep pace. New technologies (blockchain, AI-driven auditing, cloud accounting) present unprecedented challenges for regulators, auditors, and practitioners regarding transparency, accountability, data security, and algorithmic bias (Jena, 2025; H.waykole, 2025), (Kardys-Stone & Kasztelnik, 2025).

The accounting profession faces mounting pressure to embed ethics, integrity, and professional judgment into automated systems. Yet the potential for AI bias, algorithmic opacity, and the displacement of human judgment introduces risks that standards bodies and regulators are only beginning to address (Ahmed et al., 2025; Deliu & Olariu, 2024).

RECOMMENDATIONS

For educational institutions:

Integrate digital and data literacy into core curricula (Judijanto et al., 2025; Razali et al., 2022). Accounting programs must embed data analytics, basic programming, cloud computing, and AI literacy alongside traditional financial accounting content. This requires collaboration between accounting departments and data science, technology, and business analytics faculty (AlHtaybat et al., 2018).

For standard-setters (IASB, ISSB, IAASB, professional bodies):

Consolidate and harmonize ESG frameworks (Villiers & Dimes, 2022), (Edge, 2022). Rather than permitting the proliferation of ESG standards, convene a multi-stakeholder consensus to develop unified, globally recognized frameworks. This will reduce compliance burden and restore comparability—the original goal of IFRS.

Develop governance standards for AI and emerging technologies (Jena, 2025), (H.waykole, 2025). Standards bodies should issue guidance on algorithmic transparency, bias mitigation, data governance, and the role of human judgment in AI-augmented audit and reporting processes.

For accounting firms and organizations:

Implement retraining and upskilling programs (Judijanto et al., 2025), (Londoo-Cardozo, 2025), (Odonkor et al., 2024). Provide structured pathways for current accountants to develop digital competencies, particularly in data

analytics, cloud systems, and AI applications. These are not optional add-ons but essential skills for professional relevance.

For national regulators and accounting bodies:

Pursue pragmatic IFRS convergence aligned with local contexts (Bengtsson & Argento, 2023), (Syahrani et al., 2025). Rather than rigid, one-size-fits-all adoption, permit regulatory flexibility that allows countries to adapt IFRS to local legal, economic, and institutional contexts. This balanced approach accelerates adoption while maintaining relevance.

Strengthen audit quality and professional judgment (Gomaa, 2025). Counterbalance automation with renewed emphasis on auditor skepticism, professional judgment, and ethical awareness. Establish clear boundaries on algorithm-driven decisions, ensuring human accountability remains paramount.

For all stakeholders:

Embrace integrated reporting as a transitional framework (Edge, 2022), (Arnaboldi et al., 2017). Rather than separate financial and non-financial reporting, move toward integrated reporting that combines financial, social, environmental, and governance information into a holistic narrative. This requires new technologies (big data, analytics) and skills.

Develop robust ESG data governance frameworks (Oliveira et al., 2023), (Zhang, 2024). Organizations must establish systems to ensure ESG data is as reliable and auditable as financial data. This includes standardized data collection, quality assurance, and external assurance mechanisms.

For professional bodies and firms:

Address barriers to entry and advancement (Musundwa & Moses, 2024). The accounting profession remains subject to structural inequities. Professional bodies must deliberately dismantle barriers related to race, gender, socioeconomic status, and cultural background to ensure accounting reflects the diversity of society.

Promote diverse voices in standard-setting and governance (Oliveira et al., 2023). Regulatory boards, standardsetting committees, and professional organizations should actively recruit and retain individuals from underrepresented groups. Diverse perspectives improve the relevance and robustness of standards and practices.

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