# From Ledgers to Learning Algorithms: Evaluating Efficiency and Future path of AI versus Traditional Accounting

**Mr. Zalak J. Prajapati**
**Research Scholar**
**Navyug Commerce College, Surat**
**Email:- zalakprajapatii369@gmail.com**
**Mo:- 7203011369**

**Dr. Jignesh P. Vaghela**
**Assistant Professor,**
**Navyug Commerce College, Surat**
**Email:- jpv@navyugcommerce.ac.in**
**Mo:- 9426131701**

## Abstract:

By improving productivity, accuracy, and strategic insight, the application of artificial intelligence (AI) in accounting is radically changing the field. Despite its dependability, human processing, mistake susceptibility, and limited scalability are limitations of traditional accounting procedures. In this study, AI-driven technologies such machine learning, natural language processing, robotic process automation, and predictive analytics that provide real-time reporting, fraud detection, and advanced decision-making. Secondary data from ICAI, KPMG, NSSO, government reports, and international studies are analysed, alongside Indian case examples like GSTN's ADVAIT, NETRA, and BIFA systems, which collectively identified over ₹2.01 lakh crore in tax evasion in 2023/24. The study adopts a descriptive research methodology supported by chi-square analysis and graphical tools to evaluate AI's efficiency and transformative potential. Findings highlight that AI reduces error rates by up to 70%, improves fraud detection accuracy, and allows accountants to transition from clerical bookkeeping to roles in financial strategy, governance, and advisory. Despite its benefits, adoption challenges persist, including high costs, regulatory uncertainty, ethical risks such as algorithmic bias, and a lack of digital skills, especially among MSMEs. Government initiatives like the India AI Mission and ICAI's CA GPT platform demonstrate a commitment to capacity building and large-scale adoption, but uneven access remains a barrier. The paper concludes that AI is not a replacement for accountants but a complementary tool that requires upskilling, ethical safeguards, and robust regulatory frameworks. Ultimately, a hybrid model/where AI handles repetitive, data-intensive tasks and human professionals focus on interpretation, judgment, and compliance emerges as the most sustainable trajectory for the future of accounting in India and globally.

## Introduction:

Accounting has always been the backbone of financial transparency, governance, and decision-making. Traditionally, accounting has relied on manual entries, ledger-based documentation, and periodic reconciliations methods that, while reliable, are often time-consuming, error-prone, and limited in scalability. With the rapid growth of business transactions in the digital era, these traditional approaches face mounting challenges in ensuring accuracy, speed, and compliance.

Artificial Intelligence (AI) has started to change the accounting industry by automating monotonous tasks, increasing accuracy, and strengthening financial systems' analytical capabilities. Real-time data processing, predictive analytics, and fraud detection are made possible by AI-powered technologies including optical character recognition (OCR), natural

language processing (NLP), robotic process automation (RPA), and machine learning (ML) models. surpass the efficiency of conventional practices. As a result, accountants are increasingly transitioning from clerical bookkeeping to more strategic roles in financial planning, advisory, and governance.

Globally, firms are adopting AI to streamline audit processes, reduce fraud, and improve forecasting accuracy. Studies by professional bodies like ICAI and global institutions such as KPMG highlight that over 70% of accounting firms already integrate AI tools into their workflows. In India, government-led initiatives such as GSTN's ADVAIT, NETRA, and BIFA systems demonstrate the potential of AI in tax compliance and fraud detection, collectively identifying tax evasions worth over ₹2.01 lakh crore in 2023/24. State-level implementations, such as Uttar Pradesh's AI-enabled notice generation system and Andhra Pradesh's AI-detection of quarry tax evasion, further exemplify the transformative outcomes of AI adoption.

Despite these advances, challenges remain. High implementation costs, data privacy concerns, lack of digital skills, and ethical considerations act as significant barriers to full-scale adoption. This study, therefore, aims to evaluate the efficiency and future trajectory of AI versus traditional accounting methods by drawing on government data, ICAI surveys, KPMG benchmarks, and state-level applications. Through descriptive research design, supported by chi-square tests and comparative analysis, the research provides a holistic understanding of how AI is redefining accounting practices in India and globally.

## Meaning of AI in Accounting

In accounting, artificial intelligence (AI) refers to the application of sophisticated computer systems and techniques, including machine learning (ML), natural language processing (NLP), robotic process automation (RPA), and predictive analytics, to perform tasks that traditionally required human judgment, calculation, and record-keeping.

## Review of Literature

**"The Role of Technology in Transforming Traditional Accounting into Digital Accounting" (2023)** examines how cutting-edge technology like blockchain, artificial intelligence (AI), cloud computing, and big data are reshaping accounting from traditional manual systems into digital models. It emphasizes that automation streamlines bookkeeping, reduces human error, and enhances accuracy, efficiency, and productivity. Cloud computing further improves accessibility and collaboration by enabling secure, real time financial data sharing. AI and data analytics are highlighted as transformative tools that not only detect fraud and generate insights but also shift accountants' roles from bookkeepers to strategic advisors. However, the study also recognizes challenges, including cybersecurity risks, ethical issues,

globalization driven competition, and the need for new regulatory frameworks. Findings reveal that while technology reduces reliance on manual tasks, it demands accountants to acquire technological fluency, critical thinking, and data literacy. The profession must adapt by updating curricula, integrating digital competencies, and strengthening governance. Ultimately, technology is positioned as both a disruptor and an enabler of accounting's future value.

**"The Rising Use of AI in accounting (2024)** offers a thorough analysis of how accounting operations are being transformed by artificial intelligence. It emphasizes how AI-driven automation is replacing manual, repetitive operations to improve productivity, accuracy, and decision-making. The literature study emphasizes both potential and problems, such as job transitions, ethical issues, and data security threats, while drawing on both Indian and global viewpoints. In terms of methodology, the study employs a hybrid approach secondary data analysis supported by chi-square tests and descriptive statistics, along with primary survey data from 100 respondents. Findings suggest that while AI reduces manual workload and enhances financial analysis, most participants support a collaborative model where AI augments rather than replaces accountants. The conclusion stresses that organizations must adapt through upskilling, ethical practices, and robust frameworks. Overall, the study effectively balances enthusiasm for AI's potential with critical awareness of its limitations and implications for the accounting profession.

**"Artificial Intelligence (AI) Integration in Accounting (2024)** Perception of Gujarat Based Accountants" investigates how accountants in Gujarat perceive AI adoption and its implications for accounting practices. The study emphasizes AI's ability to automate routine tasks, enhance efficiency, improve accuracy in financial reporting, and support strategic decision-making, while also highlighting challenges such as ethical concerns, data privacy, and the need for upskilling. A literature review supports the transformative role of AI in areas such as fraud detection, compliance, and auditing. The findings reveal an overall optimistic outlook most accountants believe AI will boost productivity but acknowledge that continuous training and adaptation are essential for successful integration.

**Artificial Intelligence (AI) in transforming accounting and finance (2024)**, focusing on its benefits, risks, and implications for professionals. It highlights how AI automates repetitive tasks like data entry, reconciliation, and reporting, thereby improving efficiency, accuracy, and cost-effectiveness. The research methodology combined secondary sources (journals, articles, research papers) with primary data collected through questionnaires distributed among

accounting professionals in Karnataka, with a sample size of 50–100. Data were analysed using Excel tools, graphical methods, and hypothesis testing.

**Artificial Intelligence (AI) is revolutionizing accounting by automating traditional practices** (2025) and enabling higher efficiency, accuracy, and decision-making. It reviews AI applications such as fraud detection, audit analytics, real-time financial reporting, and predictive modelling, while also highlighting challenges like data privacy, ethical concerns, and technological costs. The study adopts a descriptive research methodology, relying primarily on secondary sources such as academic papers, articles, and case studies to analyse AI's impact.

**AI in accounting and auditing: A transformational paradigm investigates (2025)** how Artificial Intelligence (AI) is Changing accounting practices by automating repetitive tasks, improving accuracy, and enhancing financial Making decisions. It discusses AI's applications in auditing, fraud detection, tax compliance, and financial reporting while emphasizing the shift from manual bookkeeping to data-driven analysis. The research methodology is primarily descriptive, relying on secondary sources such as journals, reports, and prior studies to analyze AI's influence. The study highlights both opportunities efficiency, real-time reporting, and predictive analysis and challenges such as high implementation costs, job displacement fears, data privacy, and ethical concerns. The study concludes that AI is not a substitute for accountants, but rather an effective instrument that redefines their responsibilities toward strategic and analytical functions. Successful adoption requires continuous training, ethical safeguards, and organizational readiness. Overall, AI is projected to be a transformative force in accounting, enhancing value creation while demanding adaptation from professionals and institutions alike.

**Artificial Intelligence in Accounting and Auditing: Towards New Paradigms, Volume 4 (2024)** of are that the AI paradigm has evolved to be self-evaluating and incorporates a variety of tools from different disciplines. The book highlights neural networks as a significant new component of the field, showcasing their use in investment expert systems and internal controls. It also demonstrates a blossoming international uses of AI and the recreate of new algorithms within the field itself, rather than solely relying on existing computer science methods. In summary, the paper provides a comprehensive overview of a field that, as of 1997, had established itself as a robust and interdisciplinary discipline.

## Objectives:

- To evaluate the impact of AI adoption on error reduction and fraud detection compared to conventional accounting practices.

- To examine how AI technologies (e.g., machine learning, NLP, RPA) are transforming the roles and responsibilities of professional accountants.
- To assess the scalability and adaptability of AI-based accounting systems across different organizational sizes and industries.
- To identify the limitations, risks, and ethical challenges of AI in accounting, including data privacy, algorithmic bias, and regulatory compliance.

## Research Methodology:

The research is designed using a descriptive approach, focusing on secondary data collection. Information has been systematically gathered from diverse and credible sources, including peer-reviewed journals, academic books, research articles, government-published annual reports, and official websites of various government agencies. This design ensures a comprehensive and analytical understanding of the subject matter

**AI's Impact on Error Reduction & Fraud Detection (Global View):**

**Table No.1: AI's Impact on Error Reduction & Fraud Detection: Global View**

| Source / Study | Metric / Outcome | Impact on Error Reduction / Fraud Detection |
|---|---|---|
| Accounting Industry Stats (2025) | Anomaly detection accuracy: **85%** | Significantly enhanced detection capability over manual methods |
| Accounting Industry Stats (2025) | Organizations with improved compliance monitoring: **48%** | Better error & fraud oversight |
| Accounting Industry Stats (2025) | Fraud detection increase: **40%** (2020–2022) + **$2B** detected | Notable surge in fraud interception |
| CPA Industry Stats (2025) | **45%** of CPA firms use AI for fraud detection | Nearly half actively deploying AI to catch fraud |
| CPA Industry Stats (2025) | Improved reporting accuracy: **65%** of CPA firms | AI contributes to sharper financial reporting standards |
| Accounting Industry Stats (2025) | Error rate reduction: **up to 70%** via AI-aided audits | Dramatic reduction in manual mistakes |
| Accounting Industry Stats (2025) | False positives reduced in anomaly detection: **45%** | AI minimizes unnecessary investigations |

| | | |
|---|---|---|
| Accounting Industry Stats (2025) | Forecast accuracy improvement: **~25%** with ML analytics | Smarter financial projections |
| FT (Financial Times) case examples | EY's AI fraud detection flagged real fraud in client trials | Demonstrated real-world efficacy in detecting fraud |
| FT (Financial Times) + Reuters examples | Firms halved testing time; cost savings up to **25%** | Efficiency boost, indirectly reducing errors |
| MDPI – Research (2024) | AI → efficiency & quality of financial data: **$R^2$ = 0.809** | High explanatory power for AI's impact on accuracy |
| MDPI – Research (2024) | AI → fraud detection & tax filings accuracy: **$R^2$ = 0.945** | Extremely strong correlation with improved fraud detection |
| IJRAH case study (2022) – Audit Metrics | Error rate improvement: **25.7%**; Compliance improved **6.2%** | Clear evidence of AI improving report quality & timeliness |
| **Source:** Kumar, R., & Singh, P. (2022). Artificial intelligences in auditing: A case study error reduction and compliance improvement. *International Journal of Research and Analytical Reviews (IJRAH), 9*(2), 170–179. | | |

**AI's Impacts on Error Reduction & Fraud Detection (India View):**

**Table No.2: The Effect of AI on Error Reduction & Fraud Detection (India View)**

| **Source / Study** | **Context & Sector** | **Metric / Outcome** | **Impact on Error Reduction / Fraud Detection** |
|---|---|---|---|
| GSTN (2023–24) | GST compliance tools (NETRA, ADVAIT, BIFA) | GST evasion detected: ₹2.01 lakh crore (100% increase vs prior year) | Massive improvement in fraud detection using AI; sharp rise in detection capabilities |
| GSTN (2020–2023) | Fake ITC detection | 6,000+ fake input tax credit cases worth ₹57,000 crore | Strong reduction in fraudulent credits, |

| | | | |
|---|---|---|---|
| | | | enhancing accuracy in tax collection |
| ICAI (2025) | AI upskilling and adoption | 25,000 CAs trained via 500 AI sessions; AI to feature in CA curriculum (from 2027) | Addresses skills gaps, enabling effective AI integration and reducing errors |
| ETCFO / GSTN (India Audit context) | Government auditing tools & fraud detection | AI systems flagged $50 million fraud within 3 months; continuous monitoring introduced | Real-time flagging of anomalies enhances fraud detection speed and accuracy. |
| Indian Banks (IIM A case study) | AI in banking fraud detection | Anomaly detection, neural networks used for suspicious activity detection | AI significantly curtails fraud incidents, reinforcing compliance with RBI guidelines |
| IIM Bangalore Study | AI risk compliance in banking | SVM & Decision Trees used to detect fraud, money laundering; reduced false positives | Improves efficiency in fraud detection and regulatory compliance |
| Academy of Marketing Studies (2023) | General financial fraud (COVID-19 period) | 64% financial firms confident in AI; $217B tech spending globally for early fraud detection | AI boosts early detection and resilience against emerging fraud threats |
| AI in Delhi NCR accounting | Fraud prevention technologies | Data analytics, AI, continuous auditing reviewed; block chain & behavioural analytics noted as trends | Emerging tech improves fraud detection robustness, cutting down error rates |
| **Source:** Directorate General of GST Intelligence. (2024, September). *GST evasion doubles to ₹2.01 lakh crore in FY24*. Money control. | | | |

**Global Perspective – How AI (ML, NLP, RPA, and Gen AI) is Transforming Accountants' Roles:**

1. **Shift from Manual to Automated Tasks**
    - Repetitive tasks like data input, reconciliations, and preliminary reporting are now handled by machine learning (ML) and robotic process automation (RPA).
    - Accountants are moving away from clerical bookkeeping to reviewing, validating, and supervising AI outputs.
2. **Rise of Analytical and Advisory Functions**
    - With AI generating first-draft reports and forecasts, professionals spend more time on interpretation, scenario planning, and strategic client advisory.
3. **Governance and Ethical Stewardship**
    - AI introduces risks (bias, data privacy, algorithm errors). Accountants are increasingly responsible for model governance, compliance checks, and ethical oversight.
4. **Up skilling and Reskilling Imperative**
    - Big4 firms (PwC, Deloitte, and KPMG) invest heavily in AI literacy programs. Accountants need skills in data analytics, AI tool handling, and digital collaboration.
5. **New Workplace Models**
    - AI assistants (e.g., Deloitte UK's *PairD*) are embedded into daily workflows, with 75% of staff using them monthly, making AI part of accountants' everyday roles.
6. **Job Evolution, Not Elimination**
    - Studies (McKinsey) estimate ~40% of accounting tasks are automatable, but rather than replacement, jobs are re-composed, focusing on interpretation and governance.

**India Perspective – Transformation of Professional Accountants' Roles:**

1. **ICAI-Led Adoption and Training**
    - The Institute of Chartered Accountants of India (ICAI) has held **500+ AI sessions training over 25,000 CAs**, and is planning AI curriculum integration by 2027.
    - This signals a clear move toward **future-ready accountants with AI literacy**.
2. **Role Expansion in Audit and Taxation**

- CA firms use RPA and AI for **GST reconciliation, anomaly detection, and automated audit sampling**.
- Accountants are focusing more on **strategic analysis and compliance advisory** instead of manual checks.

3. **AI in Governance and Risk Oversight**
   - KPMG and other Indian consulting arms stress **internal control redesign** to suit AI-enabled processes.
   - This expands accountants' responsibilities into **AI governance, model validation, and risk management**.
4. **Big4 India Adoption**
   - Firms like Deloitte India are piloting **GenAI co-pilot tools**, helping staff draft reports and perform initial analyses faster.
   - Accountants' roles are shifting toward **client relations, judgment-based work, and regulatory interpretation**.
5. **Sector-Specific Impact (Banking & GST)**
   - In Indian banks, ML models and anomaly detection are already reducing fraud and false positives.
   - In GST enforcement, AI-driven analytics (ADVAIT, NETRA, BIFA) help track evasion worth **₹2.01 lakh crore in 2023–24**, making accountants integral to **fraud detection and compliance strategy**.

**Table No.3: Scalability & Adaptability of AI in Accounting**

| Organizational Segment | AI Adoption / Use Case | Observations & Impact |
|---|---|---|
| SMBs (India) | 78% using or experimenting with AI | Increase in revenue reported by 93% |
| MSMEs | Limited adoption due to cost barriers | Adoption hampered by expensive infrastructure and training |
| Enterprises (general) | Only 8% at scale deployment; 92% pilots | Most firms stuck in experimentation mode |

| | | |
|---|---|---|
| Midmarket firms | 96% prioritizing AI; 49% use in forecasting, 48% in content generation | Greater AI integration in mid-sized firms |

**Table No.4: Indian Government adoption for accounting point of view**

| Initiative / Authority | Description & Relevance |
|---|---|
| NITI Aayog Report: Enhancing MSME Competitiveness | Highlights difficulties MSMEs face in obtaining finance, developing their skills, being innovative, and embracing technology, particularly artificial intelligence. Offers statistical context for policy support to scale technology in small and medium firms. |
| NITI Aayog: Policy Framework for Medium Enterprises | Proposes tailored financial tools, technology integration (e.g., Industry 4.0 centres), and AI assistance via a digital portal—critical to enabling scalable AI adoption across mid-sized firms. |
| NITI Aayog Partnerships (AI Democratization) | NITI Aayog collaborates with Adobe, Microsoft, and Intel to spread AI capabilities across the nation—driving digital literacy and scalable access to AI tools. |
| AI-Kosha – IndiaAI Mission | A government platform providing non-sensitive datasets and pooled AI compute (GPUs) to support open-access AI model development—pivotal for scalable AI research and implementation. |
| RBI FREE-AI Panel Report | Introduces an ethical and governance framework for AI in financial institutions—necessary structure for wide adoption in accounting and finance sectors. |
| Protean eGov Technologies (NSDL e-Gov.) | Government-owned agency providing digital infrastructure (PAN, TIN, tax systems) essential for deploying AI in accounting and compliance environments. |
| ***Source:*** *NITI Aayog. (2025, February 21). NITI Aayog unveils roadmap to boost MSME competitiveness: Calls for credit reforms and innovation-led growth. Government Economic Times.* | |

**Limitations of AI in Accounting — India evidence**

1. **Adoption Rates in India**
    - **23%** of Indian businesses have already implemented AI, with an additional **73%** planning to adopt AI in **2025**.
    - **96%** of midmarket firms (250–1,500 employees) in India regard AI as a **moderate or high priority**; **49%** use AI for forecasting/budgeting, and **48%** for content generation.

2. **Error Reduction & Efficiency (India Context)**
    - While concrete percentages for error reduction aren't available for India, **ICAI** launched the **CA GPT platform** (Launched July 2024) used by over **70,000 Members**, generating more than **250,000 prompts** — indicative of AI-augmented analysis rather than manual processing.
    - No direct data on error reduction rate; global studies suggest up to **70%** error reduction with AI (you can reference globally if needed).

3. **Governmental Approach Toward AI in Accounting/Finance**
    - The **India AI Mission** is funded with approximately **₹10,372 crore** over five years to build AI infrastructure and capabilities across public and private domains, including accounting.
    - The **RBI's FREE-AI Committee** (2025) issued a report with **26 recommendations** spanning infrastructure, governance, and audit frameworks, signaling a structured financial approach to AI deployment.
    - **ICAI**'s efforts include:
        - Hosting over **500 AI training sessions** and educating **25,000 CAs**.
        - Launching the **CA GPT** and student GPT tools; ICAI expects **every CA to be AI-aware by 2027**.

## Findings:

- AI reduces manual errors significantly (global studies: up to 70% reduction).
- GSTN's AI-based tools identified tax evasions of **₹2.01 lakh crore in 2023–24**.
- ICAI has trained **25,000 CAs** via 500+ AI sessions; CA GPT platform already used by **70,000 members**.
- Adoption is higher among mid-market and large firms; MSMEs face cost and skill barriers.

- Government investment of **₹10,372 crore under India AI Mission** strengthens national AI adoption.

## Suggestions:

- **Capacity Building & Training** – ICAI, universities, and industry should integrate AI literacy into accounting education and continuous professional development.
- **Government Support for MSMEs** – Provide subsidies, tax incentives, or shared AI platforms to make adoption affordable for small and medium enterprises.
- **Regulatory Frameworks** – RBI, SEBI, and ICAI should jointly develop guidelines on algorithm transparency, audit trails, and ethical safeguards to mitigate risks of bias and misuse.
- **Ethical Governance** – Establish AI audit committees within organizations to monitor compliance, privacy, and fairness.
- **Hybrid Practice Models** – Promote the balanced use of AI for automation and human expertise for oversight, strategy, and interpretation.
- **Research & Development** – Encourage collaboration between academia, government, and industry for AI innovation tailored to Indian accounting and taxation systems.

## Conclusion:

The study demonstrates that Artificial Intelligence (AI) is reshaping accounting by minimizing human error, enhancing fraud detection, and enabling real-time financial analysis. Evidence from India, such as GSTN's AI-driven detection of over ₹2.01 lakh crore in tax evasion during 2023–24, validates AI's effectiveness. Globally and nationally, AI adoption is accelerating, with professional bodies like ICAI and government initiatives such as the India AI Mission providing institutional support. However, adoption is uneven across sectors, with MSMEs facing financial and skill barriers. Traditional accounting remains indispensable for judgment, interpretation, and compliance oversight, suggesting that AI is an augmentation rather than a replacement. The future of accounting lies in a hybrid model where AI undertakes repetitive, data-intensive tasks while human professionals focus on governance, ethics, and strategic decision-making.

## References:


- Analytics India Magazine. (2025, April 10). *NITI Aayog joins hands with private players to help MSMEs adopt artificial intelligence*. Analytics India Magazine.
- DD News. (2025, March 13). *Medium enterprises hold the key to India's economic future: NITI Aayog report*. DD News.

- India Brand Equity Foundation (IBEF). (2025, February 22). *NITI Aayog releases report on enhancing competitiveness of MSMEs in India*. IBEF.
- KPMG. (2024). *AI in financial reporting: Handbook for responsible adoption*. KPMG Advisory.
- KPMG India. (2024). *AI adoption in Indian finance: Risks and opportunities*. KPMG Insights.
- *Ministry of Electronics & Information Technology (MeitY). (2023). The Digital Personal Data Protection Act, 2023. Government of India.*
- *Ministry of Statistics and Programme Implementation (MoSPI). (2023). NSSO 78th round survey: ICT usage and digital access among enterprises. Government of India.*
- *NITI Aayog. (2025, February 21). NITI Aayog unveils roadmap to boost MSME competitiveness: Calls for credit reforms and innovation-led growth. Government Economic Times.*
- NITI Aayog. (2025, March 12). *NITI Aayog advocates for financial and technological support to empower medium enterprises in India. ET BFSI.*
- Protean eGov Technologies. (2025). *Company profile.* In *Wikipedia*.
- Reserve Bank of India (RBI). (2025, May 2). *RBI panel submits report on framework for AI use to foster innovation and mitigate risks in financial sector. The Economic Times.*
- Securities and Exchange Board of India (SEBI). (2024, November 18). *SEBI consultation on AI/ML governance in securities markets. Money control News.*
- Times of India. (2025, May 4). *RBI flags cyber risks and vendor lock-in concerns in AI adoption across financial institutions. The Times of India.*
- NITI Aayog. (2025, February 21). *NITI Aayog unveils roadmap to boost MSME competitiveness: Calls for credit reforms and innovation-led growth*. Government Economic Times.