

Applications of Generative AI in Accounting

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Abstract

With the rapid advancement of generative AI technology, its powerful capabilities in content generation and code writing are transforming industries worldwide. The traditional accounting industry stands at a critical juncture of intelligent transformation, facing urgent demands to enhance efficiency and reduce costs. This paper systematically explores the impact of generative AI on accounting workflows, analyzes specific application scenarios, and examines accompanying issues such as data security and responsibility delineation. Ultimately, it proposes a coexistence model between human and AI workforces, addressing implementation strategies, talent development, and risk oversight.

Keywords: Generative AI; Intelligent Transformation; Human-AI Collaboration; Risk and Regulation

1. Introduction

As a foundational service industry in the economy, accounting has evolved from manual ledgers to computerization, then to ERP-driven informatization, and now enters a new era of intelligent transformation. However, accounting work still heavily relies on manual processing for highly repetitive tasks, resulting in low efficiency and difficulties in identifying errors. Against this backdrop, a core question emerges: In which specific scenarios can generative AI be applied, and what unprecedented risks and challenges will it bring? How should the accounting industry leverage this technology to achieve genuine transformation and upgrading? This paper will systematically address these issues.

Theoretically, this paper integrates generative AI technology with accounting theory, deepening and expanding research directions in accounting intelligence. Practically, it provides guidance for accounting professionals navigating career transitions and skill transformations. The study follows a logical framework of "theoretical review → application scenario analysis → risk identification → model improvement." The primary research method employs case analysis,

conducting logical deduction and systematic construction through the examination of public literature, industry reports, and representative corporate practice cases.

This paper first articulates core concepts and theoretical foundations, then delves into the application scenarios of generative AI across accounting processes, systematically identifies the multiple risks it introduces, and finally proposes countermeasures.

2. Core Concepts and Theoretical Foundations

2.1. Core Technologies and Development Status of Generative AI

Generative Artificial Intelligence (Generative AI) refers to AI model systems capable of generating novel content such as text, images, audio, and code. These models learn latent patterns and distributional characteristics from massive datasets to create new content aligned with human needs and contextual expectations (Goodfellow et al., 2014). Its core technological foundations primarily include Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), autoregressive models, and the dominant Transformer architecture in recent years. This is particularly evident in large-scale pre-trained language models (PLMs) and diffusion models built upon it (Vaswani et al., 2017; Brown et al., 2020; Ho et al., 2020).

The capabilities of generative AI primarily stem from large-scale pre-training on massive multimodal datasets. This enables models not only to comprehend and capture complex contextual information but also to exhibit remarkable content creation and logical reasoning abilities (Bommasani et al., 2021). For instance, generative large models like ChatGPT and GPT-4 exhibit near-human fluency and logical coherence in natural language processing tasks. In image generation, models such as Stable Diffusion and DALL·E 3 can produce highly detailed and creative visual content based on textual prompts (Rombach et al., 2022).

From a developmental perspective, generative AI is transitioning from technical exploration to large-scale commercial application. According to data released by China's Cyberspace Administration in 2024, the user base for generative AI products in China has surpassed 515 million, with market penetration rapidly increasing. Internationally, general-purpose large models like OpenAI's ChatGPT, Anthropic's Claude, and Google's Gemini continue to undergo iterative development. Domestically, models like Baidu's "Wenxin Yiyan" (ERNIE series), Alibaba's "Tongyi Qianwen," and Zhipu AI's GLM are rapidly penetrating specialized vertical fields such as healthcare, finance, law, and education from general-purpose scenarios, driving profound transformations in industrial intelligence (Zhang et al., 2022; Zhao et al., 2023). This trend signifies a major paradigm shift in AI technology—from perception and understanding toward content creation—profoundly reshaping the future landscape of human-machine interaction and knowledge work.

2.2. Evolution of Accounting Information Systems

The development of accounting information systems is an evolutionary process closely intertwined with information technology innovation. It has progressed from the early stage of electronic data processing, through the era of integrated ERP systems centered on business

process integration, and is now comprehensively advancing toward the stage of intelligent accounting systems driven by data and artificial intelligence (Sutton, 2006). This evolution not only reflects leaps in technological capability but also signifies a paradigm shift in accounting functions—from traditional recording and calculation to value extraction and strategic support.

As the current frontier of development, intelligent accounting systems exhibit qualitative leaps in core characteristics compared to previous stages, primarily manifested in three aspects:

First, Automation: Systems can replace manual labor to efficiently and accurately complete large volumes of rule-based, repetitive accounting tasks. For instance, robotic process automation enables automated reconciliation, invoice processing, and voucher generation, significantly enhancing the efficiency and accuracy of foundational accounting work while freeing financial personnel from tedious transactional duties (Moffitt, Vasarhelyi & Warren, 2020).

Second, Intelligence: This constitutes the core of intelligent accounting systems. Systems leverage artificial intelligence technologies such as machine learning and natural language processing to perform complex analysis, forecasting, and judgment, providing decision support. For instance, systems can build models based on historical data to forecast sales revenue, assess customer credit risk, or identify anomalous financial transactions through intelligent analysis, delivering deep insights for management's strategic decision-making and risk control (Zhang, Dai & Xu, 2022).

Third, Proactivity: This signifies a fundamental shift in the accounting function—transitioning from traditional "post-event" accounting oversight to "real-time" in-process control and "pre-event" forward-looking forecasting. Leveraging big data analytics and real-time data processing technologies, intelligent accounting systems continuously monitor business operations, provide dynamic performance feedback, and simulate financial outcomes under different strategic scenarios. This empowers enterprises to engage in more forward-looking management and planning (Richins, Stapleton & Stratopoulos, 2017).

3. In-Depth Analysis of Generative AI Applications in Accounting

3.1. Automation and Intelligent Upgrades at the Accounting Transaction Level

At the accounting layer, generative AI leverages natural language processing (NLP) and machine learning technologies to optimize and reconstruct traditional accounting processes.

(1) Intelligent Voucher Processing

Generative AI can interpret natural language descriptions such as "prepayment to a supplier" to automatically match accounting accounts and generate complete journal entries. This capability significantly reduces manual labor while enhancing accuracy and efficiency in voucher processing. For instance, systems trained on vast historical voucher datasets can learn account matching rules across diverse business scenarios, enabling automated handling of complex transactions (Jiang et al., 2021).

(2) Automated Reconciliation and Review

Generative AI can automatically compare bank statements with corporate accounts, generate reconciliation reports, and perform preliminary analysis of discrepancies. For instance, the system can identify common causes of differences like "payments in transit" and flag them for accountants' attention. Research indicates this automated reconciliation approach reduces reconciliation time by over 50% while significantly lowering human error rates (Smith & Johnson, 2020).

(3) Report Generation and Interpretation

Generative AI can now automatically generate basic financial statements and add natural language annotations to help non-specialists understand financial data. For instance, systems can produce concise analyses based on income statement data, such as "Net profit for the period increased by 15% year-over-year, primarily driven by higher sales revenue." This functionality not only enhances reporting efficiency but also improves the readability and usability of financial information (Brown & Davis, 2022).

3.2. Risk Alerting for Accounting Management

At the accounting management level, generative AI evolves from a basic operational executor into a critical analytical partner and risk radar. By deeply analyzing structured and unstructured data, it provides profound insights and forward-looking warnings for management decisions.

(1) Risk Insights

Generative AI can automatically scan and parse vast amounts of unstructured data—such as contracts, invoices, and announcements—to precisely identify potential risk clauses. These include abnormal payment terms, unclear liability for breach, or inadequate disclosure of related-party transactions. The system not only flags risks but also performs preliminary risk grading and categorization based on historical data and rule sets. For example, it may alert: "This clause may increase future cash flow uncertainty." Research indicates that models based on the Transformer architecture excel at understanding the semantics of legal and contractual texts, effectively enhancing the coverage and accuracy of risk identification (Wilson & Lee, 2019).

(2) Cash Flow Forecasting and Management

Transcending traditional historical data-based models, generative AI integrates external textual information such as macroeconomic news, industry trends, and client social media dynamics to generate more dynamic and forward-looking cash flow forecast reports. For instance, it can simulate the impact of different market scenarios (such as fluctuations in key raw material prices) on a company's future quarterly cash flows, describing key drivers and risk points in natural language, such as: "Cash flow is expected to face pressure in the next quarter, primarily due to weak demand in the industry of a major client" (Chen et al., 2022).

(3) Management Reporting and Decision Simulation

For accounting management, generative AI can produce in-depth management analysis reports on demand. For instance, upon detecting abnormal growth in sales expenses, the AI not only

reports the facts but further analyzes: "The increase in sales expenses is primarily concentrated in travel and entertainment costs, highly correlated with activities of the newly established East China market team. It is recommended to further evaluate the input-output efficiency of this market." Additionally, it can function as a "decision laboratory," simulating scenarios like "if prices increase by 5%" or "if supplier payment terms extend by 30 days" to generate analyses of potential impacts on gross margin, cash flow, and net profit, providing management with data-driven decision options (Davenport & Ronanki, 2018).

3.3. Practical Applications of Generative AI

The value of generative AI in accounting has been validated through numerous domestic and international cases, demonstrating its efficacy across multiple dimensions including efficiency gains, enhanced accuracy, and cost savings.

Case Study 1: Intelligent Practices of LemonCloud Financial Software in China

Lemon Cloud, a leading domestic intelligent financial software platform, has completed a full-process intelligent upgrade of its "AI-generated accounting vouchers" feature. After financial staff upload attachments like bank receipts and VAT invoices, the AI automatically identifies key information (transaction type, amount, account) via OCR (Optical Character Recognition) and NLP technology. Within 10 seconds, it matches accounting subjects to generate complete journal entries. If only textual business descriptions are provided, the AI automatically detects missing information (e.g., counterpart account or amount), prompts for supplementation, and then accurately generates vouchers compliant with accounting standards. A Beijing-based bookkeeping firm saw its accountants handle 200 clients per month instead of 80, with voucher error rates dropping 40% and labor costs nearly halved. This case demonstrates generative AI's immense potential for operational cost reduction and efficiency gains (Liu et al., 2023).

Case Study 2: Audit Process Innovation at International Accounting Firms

A globally leading accounting firm is deeply integrating generative AI into its audit platform. During the initial audit phase, AI can automatically analyze all client contracts and transactions for the entire year, identifying transaction samples with specific risks—such as complex revenue recognition terms—for auditors to prioritize. During substantive procedures, AI not only performs comprehensive automated reconciliations but also generates preliminary analytical explanations for key fluctuations—such as "Why did administrative expenses surge by 20% in Q3?"—enabling auditors to validate findings and conduct in-depth investigations. This significantly enhances audit focus and efficiency (KPMG, 2023). This application frees auditors from tedious reconciliation and preliminary analysis tasks, allowing them to focus on higher-value professional judgment and risk assessment.

Case Study 3: Intelligent Financial Analysis and Reporting for Multinational Corporations

A multinational manufacturing enterprise leveraged generative AI to transform its monthly consolidated reporting process. The system automatically extracts data from subsidiaries' ERP systems, generates unified consolidated financial statements, and drafts multilingual Management Discussion and Analysis (MD&A). The draft not only tracks changes in key financial ratios but

also integrates textual explanations from business lines to provide coherent interpretations of performance fluctuations. This allows the group headquarters' finance team to shift focus from data collection and report compilation to strategic insight generation, reducing the reporting cycle by approximately 60% (Deloitte, 2024). This marks the evolution of generative AI applications from transactional processing toward high-value strategic support.

Case Study 4: Intelligent Agents Reshape Financial Processes

Recently, the case study “AWS AI Agent Empowering Enterprise Shared Service Centers,” jointly submitted by Yanhuang Yingdong and its partners, was selected for the 2025 National Enterprise “AI+” Action Innovation Case TOP 100 Awards. This initiative is co-hosted by Internet Weekly, eNet Research Institute, and Deben Consulting, establishing the project as a benchmark in financial intelligence. Based on AWS services like Amazon Bedrock, Yanhuang Yingdong and its partners built an intelligent agent for the shared service center. This agent enables scenarios such as intelligent form filling, document review, and automated archiving, achieving a 95% increase in document processing efficiency, a 75% reduction in labor costs, and an error rate below 0.1%. This demonstrates that the role of finance professionals must and is shifting due to generative AI applications: from process executors to process designers and AI architects. It also provides empirical evidence for the intelligent transformation of the accounting profession and the need for multi-skilled talent.

4. Risks Associated with Generative AI Applications

4.1. Technical Risks

Data Security and Privacy Breaches: Corporate financial data faces risks of exposure or misuse when uploaded to cloud-based models for processing. Accounting personnel may inadvertently disclose company data without awareness. User-input data risks being utilized for model training and consequently stored in the cloud.

4.2. Operational and Compliance Risks

Liability Determination Dilemma: When financial reports generated by AI and signed off by financial managers contain material misstatements, determining the responsibility of involved personnel becomes challenging.

Impact on Existing Internal Controls: After traditional "document creation-review-bookkeeping" processes are automated by AI, new control points must be designed to ensure the accuracy of AI outputs. An effective AI output review mechanism must be established.

Technology Dependency and System Risk: Overreliance on AI may cause the entire financial process to grind to a halt during system failures or service interruptions.

4.3. Transformation in Demand for Accounting Professions and Talent

Generative AI will first replace highly rule-based, repetitive accounting roles, creating direct transformation pressure for entry-level accountants. Future markets will increasingly demand

versatile professionals who can master AI tools, make complex judgments, and communicate effectively.

4.4. Current legal principles governing AI applications

The EU's Artificial Intelligence Act classifies AI systems used in financial reporting and similar domains as “ high-risk. ” It mandates that deployers establish human oversight mechanisms to intervene or override decisions when necessary. This legally establishes human ultimate responsibility for high-risk AI decision-making.

Article 9 of China's Interim Measures for the Administration of Generative Artificial Intelligence Services stipulates that providers shall bear legal responsibility as producers of online information content. This clarifies liability requirements for providers, meaning their responsibilities cannot be transferred or exempted due to AI usage.

4.5. Specific Standards for Liability Allocation

Based on the above principles, I believe that when misreporting occurs, a blanket approach to assigning blame should be avoided. First, the root cause of the error should be traced. If the error stems from flawed original data, the data provider should bear responsibility. If the error lies in the AI algorithm, the AI developer should be held accountable. Second, determine whether the signatory fulfilled their duty of rigorous review. Failure to exercise oversight and verification obligations warrants corresponding liability. Finally, investigate whether AI was intentionally misused for fraud, clarifying whether there was deliberate manipulation of input data or misleading of AI to generate false reports. Individuals committing fraud should bear legal responsibility.

5. Response Strategies and Future Development Pathways

5.1. Implementation Pathways at the Enterprise Level

First, prioritize strategy and implement in phases: Enterprises should establish a clear generative AI application roadmap, starting with low-risk applications like "intelligent voucher processing" and "automated report generation," then gradually refining and expanding deployment. Second, establish a new coexistence model between human and AI work: Clearly define the boundaries of responsibilities between AI and humans. AI handles foundational and repetitive tasks like draft generation, data preprocessing, and preliminary analysis, while human accountants focus on verification, judgment, decision-making, and in-depth communication — essentially oversight and higher-level functions. Human involvement remains crucial for ensuring AI work quality. Third, establish control policies: Create dedicated AI application policies covering standardized query phrasing, output review processes, model update evaluations, and data security protocols.

5.2. Reskilling Individual Accounting Professionals

First, transition from "transaction-oriented" to "management-oriented": Accountants must shift focus to higher-value activities like financial analysis, budget management, investment/financing

decisions, and risk management. Second, become AI "prompt engineers" and managers: Learn to formulate precise, efficient queries for AI while developing critical thinking to evaluate, validate, and refine AI outputs. Third, adopt a lifelong learning mindset: Proactively acquire data analytics and AI-related knowledge, continuously update skills, enhance capabilities, embrace change, and adapt to evolving demands.

6. Differentiated Analysis of Generative AI Applications

Differentiated Analysis: The application of generative AI in the accounting field has revealed a distinct pattern of differentiation. This differentiation stems from distinct core value propositions among enterprises. As a joint-stock commercial bank, Shanghai Pudong Development Bank operates under highly prudent regulatory oversight. Its primary application objective is enhancing the precision of credit decisions. By leveraging generative AI to process vast amounts of information, it reduces human error and uncovers potential risks. China South-to-North Water Diversion Group, a central enterprise responsible for operating major national water conservancy projects, features large-scale financial management with highly standardized processes. The Group pursues extreme operational efficiency and cost savings. Its application aims to directly and massively replace highly repetitive, rule-based manual labor, achieving orders-of-magnitude improvements in processing speed and accuracy. The core imperative of the financial sector is controlling uncertainty to mitigate risk, while the core imperative of large operational enterprises is optimizing deterministic processes to enhance efficiency.

Case Study 1: Financial Sector - Shanghai Pudong Development Bank - AI-Powered Financial Reporting and Analysis

Shanghai Pudong Development Bank employs generative AI technology to automatically generate financial analysis reports. The reporting system autonomously correlates internal and external data (such as corporate financial statements, industry trends, and public sentiment) to produce preliminary report drafts, specifically flagging abnormal financial indicators and potential risk points. This application liberates analysts from tedious data collation, boosting reporting efficiency while enabling them to focus on logical reasoning, in-depth interpretation, and strategic recommendations.

Case Study 2: Service Industry - China South-to-North Water Diversion Group - AI-Powered Full-Process Intelligent Audit

The South-to-North Water Diversion Group deployed an intelligent audit agent within its financial shared service center. Equipped with specialized audit rules, this agent mimics human auditors to perform end-to-end automated recognition, review, and voucher generation for eight major categories of expense reimbursement documents. From document image recognition and authenticity verification to budget reconciliation, compliance checks against reimbursement policies, and automated accounting voucher generation—the entire process requires no manual intervention. This significantly reduces labor costs, vividly demonstrating generative AI's efficiency and adaptability for repetitive, rule-based accounting tasks.

7. Conclusion

This paper systematically explores the impact of generative AI on the accounting profession. Research indicates that through contextualized applications, generative AI is transforming accounting workflows across bookkeeping, management, and auditing. However, its adoption carries multiple risks related to technology, operations, and talent. Generative AI is not the "terminator" of the accounting profession but a powerful "capability enhancer." It liberates the core value of accounting work from repetitive data processing, elevating it toward higher-level analysis, decision-making, consulting, and risk management. Future success hinges on our ability to effectively build new working models and achieve synchronized upgrades in technology, processes, and talent.

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Conceptualization, H.Z.; methodology, Y.Z.; software, Y.Z.; validation, Y.Z.; formal analysis, Y.Z.; investigation, Y.Z.; resources, Y.Z.; data curation, Y.Z.; writing—original draft preparation, Y.Z.; writing — review and editing, H.Z.; visualization, Y.Z.; supervision, H.Z.; project administration, H.Z.; All authors have read and agreed to the published version of the manuscript.

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