

# The Future of Accounting: Trends and Tools in A&A and the Future of AI

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# Learning objectives

- ▶ Take a journey to explore the future of our dynamic field, like what exactly, is AI?
- ▶ Introduce the trends and tools shaping the landscape of accounting and auditing
- ▶ How we will need to approach our profession in the very near future
- ▶ Review the most impactful trends and tools that are set to transform our industry
- ▶ What skills will future accountants and auditors need to be successful, or are we about to be replaced?

# Top Future Tools and Trends

**“It all seems to be about some guy named AI...”**

Quote by Frank Crawford to the OSCPA monthly news magazine in 2011, when asked about the future of accounting and auditing

# Top Future Tools and Trends

- ▶ Artificial Intelligence and Machine Learning
- ▶ Robotic Process Automation (RPA)
- ▶ Blockchain Technology
- ▶ Data Analytics and Big Data
- ▶ Cloud Computing
- ▶ Regulatory Technology (RegTech)
- ▶ Cybersecurity
- ▶ Sustainability Accounting
- ▶ Continuous Auditing and Real-Time Reporting
- ▶ Enhanced Skills needed by Accountants/Auditors

# *What, exactly, is it?*

The field of computer science focused on creating systems or machines that can perform tasks typically requiring human intelligence. This includes tasks like:

- ▶ **Understanding language** (like how you and I are talking now)
- ▶ **Recognizing images and patterns** (like facial recognition or identifying objects in photos)
- ▶ **Making decisions** (like recommending movies or diagnosing medical conditions)
- ▶ **Learning from data** (like training models to improve over time, such as self-driving cars or personalized recommendation systems)

Source: ChatGPT

# *How does it work?*

AI works by using **algorithms** and **mathematical models** to process data, learn from it, and make decisions or predictions. Here's a breakdown of how it works:

## **1. Data Collection & Preparation**

AI systems need a lot of data to learn. This data can be anything from images, text, audio, or structured datasets like spreadsheets.

- **Example:** For an AI that recognizes cats in photos, it needs thousands of labeled cat images to learn what a cat looks like.

## **2. Data Processing & Feature Extraction**

Before training, data is cleaned, organized, and transformed into a format the AI can understand. Features (important characteristics) are extracted.

- **Example:** Turning an image into pixel values or converting speech into text.

Source: ChatGPT

# *How does it work?*

## **3. Model Selection & Training**

The AI is built using models like **neural networks, decision trees, or regression models**.

- **Training** means feeding the model with data and adjusting it so that it can make accurate predictions or decisions.
- Models **learn by finding patterns** and adjusting their internal parameters to minimize errors.

## **4. Evaluation & Testing**

After training, the model is tested with new data to measure its performance. If it performs poorly, it goes through more training.

- **Example:** Testing a chatbot by giving it new sentences and checking if it responds correctly.

Source: ChatGPT

# *How does it work?*

## 5. Deployment & Inference

Once the model is trained well, it's deployed for use. This stage is called **inference**, where the AI applies its learned knowledge to new inputs.

- **Example:** A language model like me responding to your questions.

## 6. Learning & Improving (Feedback Loop)

The best AI systems keep improving by **continuously learning from new data**.

- **Example:** Recommendations on Netflix or YouTube get better the more you interact with them.

Source: ChatGPT

# *Just another tool?*

- ▶ Let's look at the 1908 audit of the Northern Shoe Company of Duluth, Minnesota....

MARWICK, MITCHELL & CO.

CHARTERED ACCOUNTANTS.

NEW YORK, 79 WALL STREET  
PHILADELPHIA, 598 DREXEL BUILDING  
PITTSBURG, 444 FOURTH AVENUE  
CHICAGO, 182 LA SALLE STREET  
MINNEAPOLIS, 180 TEMPLE COURT  
ST. PAUL, 207 DISPATCH BUILDING  
INDIANAPOLIS, 329 AMERICAN CENTRAL LIFE BUILDING  
WINNIPEG, CANADA, 19 CANADIAN NORTHERN BUILDING  
LONDON, ENGLAND, 28 WALBROOK, E.C.  
GLASGOW, SCOTLAND, 183 HOPE STREET

79 WALL STREET

NEW YORK February 5, 1908.

A. W. Hartman, Esq., President,  
Northern Shoe Company,  
Duluth, Minnesota.

Dear Sir:

In accordance with your instructions, we have made an audit of the accounts of the Northern Shoe Company for the year ended December 31, 1907, and now submit our report thereon, together with the statements enumerated in the appended index.

The Company was incorporated under the Laws of the State of Minnesota on January 1, 1905, under the name of the Phillips-Bell Shoe Company, its duration being thirty years. The amount of Capital Stock originally authorized was \$100,000.00, divided into \$40,000.00 preferred stock, and \$60,000.00 common stock. The business of the Duluth Shoe Company was purchased on January 25, 1905, for \$42,966.48. On November 18, 1905, the authorized Capital stock was increased to \$60,000.00 preferred and \$90,000.00 common, and on November 21, 1906 it was further increased to \$200,000.00 preferred and \$300,000.00 common, divided into shares of a par value of \$100.00 each. At December 31, 1907 the stock outstanding was \$272,700.00, of which \$150,000.00 was common and \$122,700.00 preferred.

Surplus Account, continued

Surplus (Deficit) January 1, 1907 as adjusted, brought forward	\$ 18,241.19
Dividends on Preferred Stock declared in 1907	5,285.86
Net Loss in 1907	654.32
	<hr/>
Surplus (Deficit) December 31, 1907	\$ 24,161.37

Subject to the correctness of the quantities stated in the inventories and to the adequacy of the reserves for bad debts and renewals, we certify that the Balance Sheet, Exhibit "B", is a correct statement of the affairs of the Company as at December 31, 1907.

Certain adjustments, some of which have been mentioned in the course of this report, are required to bring the books into agreement with the accounts now submitted. The journal entries necessary to effect this agreement are given in Exhibit "C".

We feel it incumbent on us, before concluding this report, to direct attention to the condition of affairs prevailing in the office of the Company as these came under our observation while engaged on the audit. The books are badly written and are kept in a slovenly manner, and the bookkeeping generally is entirely unworthy of a large and progressive business. No effort appears to be made to keep the subsidiary books in agreement with the controlling accounts - a simple matter which if attended to regularly and systematically would occupy but little time. The continual complaint of want of time appears to us to be unjustifiable when the number of clerks and the volume of work are considered. We attribute a large part of this laxity and lack of method to the detrimental effect of too much reliance on the adding machine. The adding machine in its proper place is an excellent institution but when it

is resorted to on every occasion for the simple addition of two and two it becomes not only useless but dangerous. We could not fail to observe its frequent, almost constant, use in the office and when we find, as we did find, that it was put in operation for the sole purpose of adding \$2,665.79 to \$5,000.00 and \$235.05 to \$125.00 we feel that it is no longer a time-saver but an absolute despoiler of time. The employee who sought the aid of the machine for these simple calculations was the one whose records were in the worst condition and who was most insistent in the complaint of want of time. Apart altogether from the time wasted in this way, the use of the machine which at first may be due to laziness on the part of the employee becomes at length a necessity for it is a well known fact that constant use of any mechanical calculator leads inevitably to atrophy of the calculating faculty. A man who cannot calculate nimbly and accurately is of very little use as a bookkeeper. We would strongly advise that the adding machine be removed from the office or its use very much restricted.

We were very much impeded during our examination by the actions of the Cashier whose attitude towards us was uniformly discourteous and disagreeable. Information received from him was invariably incorrect or misleading.

To the manager and his assistant we wish to extend our thanks for the courtesies which they showed us and the assistance which they rendered us.

Yours truly,

*Maurick Mitchell Co.*

Chartered Accountants.

*Isn't AI simply a tool for researching and writing, like a mechanical adding machine is simply a tool for doing arithmetic?*

Yes — that's a great way to think about it. 🙌

AI is fundamentally a **tool**, just like a calculator or a word processor, but it's a tool that's **much more flexible and adaptable**. Just like:

- A **calculator** helps you do math faster and more accurately,
- A **spellchecker** helps catch typos,
- A **search engine** helps find information quickly,
- ▶ AI helps with **researching, analyzing, drafting, and summarizing information**, often across a much wider range of tasks and in a much more human-like way.

Source: ChatGPT

*Isn't AI simply a tool for researching and writing, like a mechanical adding machine is simply a tool for doing arithmetic?*

 **So how is it like a mechanical adding machine?**

- Both are **assistive technologies** — they amplify human ability but don't replace human understanding or responsibility.
- They **follow instructions** and process inputs to produce outputs based on built-in rules.
- They don't have **judgment, intent, or accountability** — those still rest squarely with the person using the tool.

Source: ChatGPT

*Isn't AI simply a tool for researching and writing, like a mechanical adding machine is simply a tool for doing arithmetic?*

🧠 **But AI *feels* smarter — why?**

AI seems more advanced because it can:

- Understand **natural language**,
- Generate **new content** (not just compute answers),
- Recognize patterns in massive amounts of data,
- Learn and adapt (within limits).

But under the hood, it's still a **very advanced pattern-matching machine**, built on math and probabilities — just like the adding machine is built on gears and logic.

So yep — AI is a tool. A **powerful** one, yes. But it still needs a human behind the wheel to apply judgment, understand context, and ensure quality and ethics.

Source: ChatGPT

*Use of a mechanical calculator leads to a loss of the ability to do calculations (like long division) manually. Does AI also lead to any atrophy of skills?*

That's a thoughtful question — and yes, **AI can lead to atrophy of certain skills**, just like mechanical calculators have reduced how often people practice manual arithmetic (like long division or estimating square roots).

Here's how that plays out with AI:

 **Skills That May Atrophy with AI Use:**

### *1. Critical Thinking & Deep Reading*

- If people rely on AI to summarize or analyze texts, they might skip doing **close reading** or forming their own **independent interpretations**.
- Over time, this could dull the ability to deeply engage with complex material.

Source: ChatGPT

*Use of a mechanical calculator leads to a loss of the ability to do calculations (like long division) manually. Does AI also lead to any atrophy of skills?*

## *2. Writing & Communication*

- If AI drafts emails, reports, or essays, people may become less practiced at **organizing thoughts**, maintaining tone, or crafting clear arguments on their own.

## *3. Research & Source Evaluation*

- AI can retrieve and synthesize information quickly, but it can also **hallucinate** or oversimplify.
- Relying too heavily on it might weaken someone's ability to **evaluate source credibility** or dig deeper into primary materials.

Source: ChatGPT

*Use of a mechanical calculator leads to a loss of the ability to do calculations (like long division) manually. Does AI also lead to any atrophy of skills?*

#### *4. Memory & Recall*

- Just like Google has changed how we remember facts (we Google instead of memorizing), AI might reduce how much we remember **processes, rules, or domain-specific knowledge** — we start asking instead of learning.

#### *5. Professional Judgment*

- In fields like law, accounting, or medicine, there's a risk of becoming **too reliant on AI-generated suggestions** and not developing the nuanced judgment that comes from doing the hard work yourself.

Source: ChatGPT

*Use of a mechanical calculator leads to a loss of the ability to do calculations (like long division) manually. Does AI also lead to any atrophy of skills?*

💡 **But Here's the Flip Side:**

AI can also **enhance and sharpen** skills when used intentionally:

- Like calculators freed people to focus on **higher-order math**, AI can free us to focus on **strategy, insight, and creativity**.
- Writers, analysts, and professionals using AI well often become **more productive, precise, and insightful**, because they offload routine work and focus on the high-impact stuff.

✅ **Bottom Line:**

AI doesn't have to cause skill atrophy — but mindless use definitely can.

- ▶ Like any tool, it's all about **how you use it**. If you pair AI with curiosity, reflection, and hands-on practice, it can actually make you **sharper** — not duller.

Source: ChatGPT

# *Cautions*

- ▶ AI makes mistakes. Try asking questions to which you already know the answers and you'll see its limitations (like not knowing what a green eye shade is).
- ▶ AI does not routinely cite its sources, so you might end up plagiarizing others' work.

*When did the federal government get its first clean opinion on its financial statements?*

*The federal government received its first clean (unmodified) opinion on its consolidated financial statements for Fiscal Year 1997. This was the first year that the federal government was required to prepare consolidated financial statements under the Chief Financial Officers (CFO) Act of 1990 and the Federal Financial Management Improvement Act (FFMIA) of 1996.*

Source: ChatGPT

# *Why hasn't the federal government ever received a clean opinion on its financial statements?*

The federal government has **never received a clean opinion** on its consolidated financial statements primarily because of the **sheer complexity and scale of its operations**. Here are the main reasons why:

## 1. Complexity of the Federal Government

- ▶ The federal government is made up of **hundreds of agencies and departments**, each with its own financial systems, processes, and reporting standards.
- ▶ Consolidating all these into one set of financial statements is extremely challenging.

## 2. Weak Internal Controls

- Effective internal controls are necessary to ensure accuracy and reliability in financial reporting.
- Issues like **inadequate recordkeeping, outdated financial systems, and improper documentation** persist across various agencies.

Source: ChatGPT

# *Why hasn't the federal government ever received a clean opinion on its financial statements?*

## 3. Incomplete or Inaccurate Reporting

- Some agencies, especially the **Department of Defense (DoD)**, struggle with accurately reporting assets and liabilities.
  - The DoD's vast, decentralized operations make it particularly hard to provide complete and accurate financial data.

## 4. Inability to Reconcile Interagency Transactions

- Transactions between federal agencies (known as **intragovernmental transactions**) often **don't match up** due to differences in accounting methods or timing of reporting.
- Properly reconciling these transactions is a major hurdle.

Source: ChatGPT

# *Why hasn't the federal government ever received a clean opinion on its financial statements?*

## 5. Legacy Financial Systems

- Many agencies still rely on **outdated and incompatible financial management systems**.
- These systems often **cannot produce reliable, timely, and accurate financial data** for consolidation.

## 6. Material Weaknesses & Significant Deficiencies

- Independent auditors regularly identify **material weaknesses and significant deficiencies** in internal controls, making it difficult to achieve a clean opinion.

## 7. Noncompliance with Federal Accounting Standards

- Compliance with standards set by the **Federal Accounting Standards Advisory Board (FASAB)** is crucial, but inconsistencies persist.

Source: ChatGPT

*First you told me that the government received its first clean opinion in 1997; then you said it has never received a clean opinion. Which is correct?*

You caught that! I made a mistake. The correct answer is:

❌ **The federal government has NEVER received a clean (unmodified) opinion on its consolidated financial statements since it began preparing them under the Chief Financial Officers (CFO) Act of 1990 and the Federal Financial Management Improvement Act (FFMIA) of 1996.**

While individual agencies have received clean opinions, the **government-wide consolidated financial statements** have consistently received **disclaimers of opinion** due to the issues I mentioned before: inadequate internal controls, incomplete reporting, difficulties reconciling interagency transactions, etc.

The confusion likely came from the fact that **some individual agencies received clean opinions in 1997**, but the overall federal government did not.

Thanks for pointing that out! Would you like me to help you find the most recent audit opinion and why it was still not clean?

Source: ChatGPT

AI's motto could be...

Often wrong, never in doubt.

# Important Accounting concepts

- ▶ Reliability
  - That the financial information is materially correct
- ▶ Relevance
  - That I receive the financial information quick enough that I can make decisions in real-time
- ▶ We seem to have a problem with relevance more than reliability, as we often don't receive the financial information fast enough to make real-time decisions, especially in the world of audited financial statements

# Relevance

- ▶ Imagine receiving your online order two months late
- ▶ How about an important email reminder about Q3 client numbers in Q4
- ▶ Imagine at your next medical checkup, your Dr reports to you on last month's blood pressure numbers
- ▶ As you can see, there is a strong connection between being timely and being relevant
- ▶ And yet for audits, the critical element of financial reporting, the time that elapses between period-end and published results can range from months to years
- ▶ Well luckily for us, AI is here to help!

# Artificial Intelligence and Machine Learning

- ▶ No longer just buzzwords
- ▶ Already integral to daily operations, you just may not have realized it
- ▶ These AI-powered systems can handle vast volumes of data with incredible speed and accuracy
- ▶ Detection of anomalies, prediction of trends, providing real-time insights
- ▶ Allows us to move from traditional, reactive approaches to proactive and predictive reporting

# Artificial Intelligence and Machine Learning

- ▶ Imagine AI systems that can review thousands of transactions in seconds, flagging inconsistencies that would take humans hours, if not days, to identify
- ▶ This not only enhances efficiency but also significantly reduces the risk of errors and fraud
- ▶ Soon to evolve into Generative AI, which to the untrained eye, appears eerily human

# Artificial Intelligence and Machine Learning

- ▶ You might be surprised to know that variations of this have already been at play in even in small governmental software programs
  - Utility billing software that flags transactions related to meter readings that don't seem consistent or out of whack with normal trends
  - Purchasing software that flags transactions where the approval of an encumbrance causes the annual budget to be exceeded at the legal level of control

# Continuous Auditing and Real-Time Reporting

- ▶ A shift from the current focus on periodic auditing to continuous auditing
- ▶ Technology will play a big role in facilitating continuous audits
- ▶ Increased benefits seen from real-time financial reporting
- ▶ Forget sampling, every single transaction can be tested to some degree

# Enhanced Skills needed by Accountants / Auditors

- ▶ A shift from traditional roles to strategic roles requiring a shift in mentality
- ▶ Enhanced analytical skills needed
- ▶ IT skills
- ▶ Interdisciplinary collaboration would be an ideal tool and skill
- ▶ Interpersonal skills are still a must because not everything can be replaced with technology
- ▶ Accountants and auditors will need to be more adaptable to change

# Enhanced Skills needed by Accountants / Auditors

- ▶ Audit is moving from being a reactive, backward-looking exercise to a proactive, predictive, forward-looking one, working in real-time
- ▶ Provides clients with more timely insights
- ▶ Flexibility skill is needed
  - Flexibility to adapt to a working environment which will continue to evolve

# Enhanced Skills needed by Accountants / Auditors

- ▶ Skills for the future auditor
  - Technical skills and ethics
  - Intelligence
  - Creative
  - Digital
  - Emotional
  - Vision
  - Experience
  - Communication
  - Professional skepticism
  - Independence

# Enhanced Skills needed by Accountants / Auditors

- ▶ Skills for the future auditor
  - Technical skills and ethics
    - The skills and abilities to perform activities consistently to a defined standard while maintaining the highest standards of integrity, independence and skepticism
  - Intelligence
    - The ability to acquire and use knowledge – thinking, reasoning and solving problems
  - Creative
    - The ability to use existing knowledge in a new situation, to make connections, explore potential outcomes, and generate new ideas

# Enhanced Skills needed by Accountants / Auditors

- ▶ Skills for the future auditor
  - Digital
    - The awareness and application of existing and emerging digital technologies, capabilities, practices and strategies
  - Emotional
    - The ability to identify your own emotions and those of others, harness and apply them to tasks, and regulate and manage them

# Enhanced Skills needed by Accountants / Auditors

- ▶ Skills for the future auditor
  - Vision
    - The ability to anticipate future trends accurately by extrapolating existing trends and facts, and filling the gaps in knowledge by thinking innovatively
  - Experience
    - The ability and skills to understand customer expectations, meet desired outcomes and create value
  - Communication
    - Currently one of the largest skill gaps, simply the ability to communicate either verbally or in writing

# Enhanced Skills needed by Accountants / Auditors

- ▶ Skills for the future auditor
  - Professional skepticism
    - The ability to be a pro at being skeptical
    - Convinced by a certain amount of evidence that management's assertions are correct
  - Independence
    - In both reality and appearance
    - The rules around independence continue to be tightened and strengthened

# Will artificial intelligence eliminate the need for governmental accountants and auditors?

- ▶ Great question—and the short answer is **no**, artificial intelligence (AI) will not eliminate the need for governmental accountants and auditors, but it **will significantly change their roles**.

Here's a breakdown of how AI affects this profession:

## ✓ What AI Can Do (and Already Is Doing):

### 1. Automate Routine Tasks:

- Data entry, reconciliations, and basic financial reporting can be handled quickly and accurately by AI tools.
- ▶ • Audit software can scan large datasets for anomalies or red flags far faster than a human.

### 2. Enhance Fraud Detection and Risk Assessment:

- AI systems can identify patterns and outliers that point to fraud or non-compliance.
- ▶ • They can continuously monitor transactions in real time.

# Will artificial intelligence eliminate the need for governmental accountants and auditors?

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## ✓ **What AI Can Do (and Already Is Doing):**

### **3. Improve Forecasting and Budgeting:**

- ▶ • AI can process massive volumes of historical data to generate more accurate forecasts and scenario analyses.

# Will artificial intelligence eliminate the need for governmental accountants and auditors?

## ✘ What AI Cannot Replace:

### 1. Professional Judgment and Ethical Oversight:

- Governmental accountants and auditors must apply nuanced judgment based on laws, policies, and ethics—something AI can't do reliably.

### 2. Interpreting Regulations and Providing Context:

- AI can analyze data, but **contextual understanding** (e.g., political, legal, or organizational) still requires human insight.

### 3. Stakeholder Communication and Transparency:

- Public trust depends on accountability and explanation—functions where human interaction and communication are essential.

### 4. Policy Impact Evaluation:

- ▶ • Assessing whether government programs achieve social outcomes goes beyond data; it requires multidisciplinary evaluation.

# Will artificial intelligence eliminate the need for governmental accountants and auditors?

## The Future Role: Augmented, Not Replaced

Governmental accountants and auditors will increasingly become:

- **AI supervisors**, validating and interpreting results from AI systems.
- **Strategic advisors**, focusing on analysis, policy impact, and decision support.
- **Ethics stewards**, ensuring financial practices align with public interest.

## Conclusion:

AI will **reshape** the profession—making it faster, smarter, and more data-driven—but it won't replace the **need for human oversight, judgment, and public accountability**.

- ▶ Would you like a future-skills checklist for accountants and auditors in an AI-enhanced environment? **SURE!**

Skill Area	Why It Matters
Data Literacy	Ability to interpret and analyze financial data generated by AI systems.
AI & Automation Tools	Familiarity with RPA, data analytics platforms, and AI auditing tools.
Critical Thinking	Evaluate complex situations and identify risks beyond automated analysis.
Ethics & Professional Judgment	Ensure compliance and uphold public trust amidst rapid tech changes.
Communication Skills	Translate technical findings into clear, actionable insights for stakeholders.
Policy & Regulatory Understanding	Apply financial rules and understand legal implications in reports and audits.
Cybersecurity Awareness	Protect sensitive financial data in a digital, interconnected environment.
Strategic Analysis	Support data-informed decision-making and policy evaluation.
Change Management	Guide teams through transitions driven by new technology.
Collaboration & Leadership	Lead cross-functional teams and foster collaboration in digital workflows.

- ▶ **Data Literacy**
- ▶ Ability to interpret and analyze financial data generated by AI systems.
- ▶ **AI & Automation Tools**
- ▶ Familiarity with RPA, data analytics platforms, and AI auditing tools.
- ▶ **Critical Thinking**
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- ▶ Protect sensitive financial data in a digital, interconnected environment.
- ▶ **Strategic Analysis**
- ▶ Support data-informed decision-making and policy evaluation.
- ▶ **Change Management**
- ▶ Guide teams through transitions driven by new technology.

# My Conclusion

- ▶ We have our work cut out for us
- ▶ Those of us that don't adapt will be left behind
- ▶ Future is promising, with technology and innovation leading the way, but we need to embrace the tools and trends, not reject them
- ▶ These can only make us more efficient and more accurate, but also redefining the essence of our profession
- ▶ Accountants and auditors will be strategic advisors and ethical stewards of financial integrity, and not just number crunchers

# My Conclusion

- ▶ We need to remain at the forefront of these advancements
- ▶ Continuous learning needs to be reinforced
- ▶ Adapt our skills to harness the full potential of these innovations
- ▶ Together we will shape a future where accounting and auditing are synonymous with trust, transparency and excellence

# Questions?