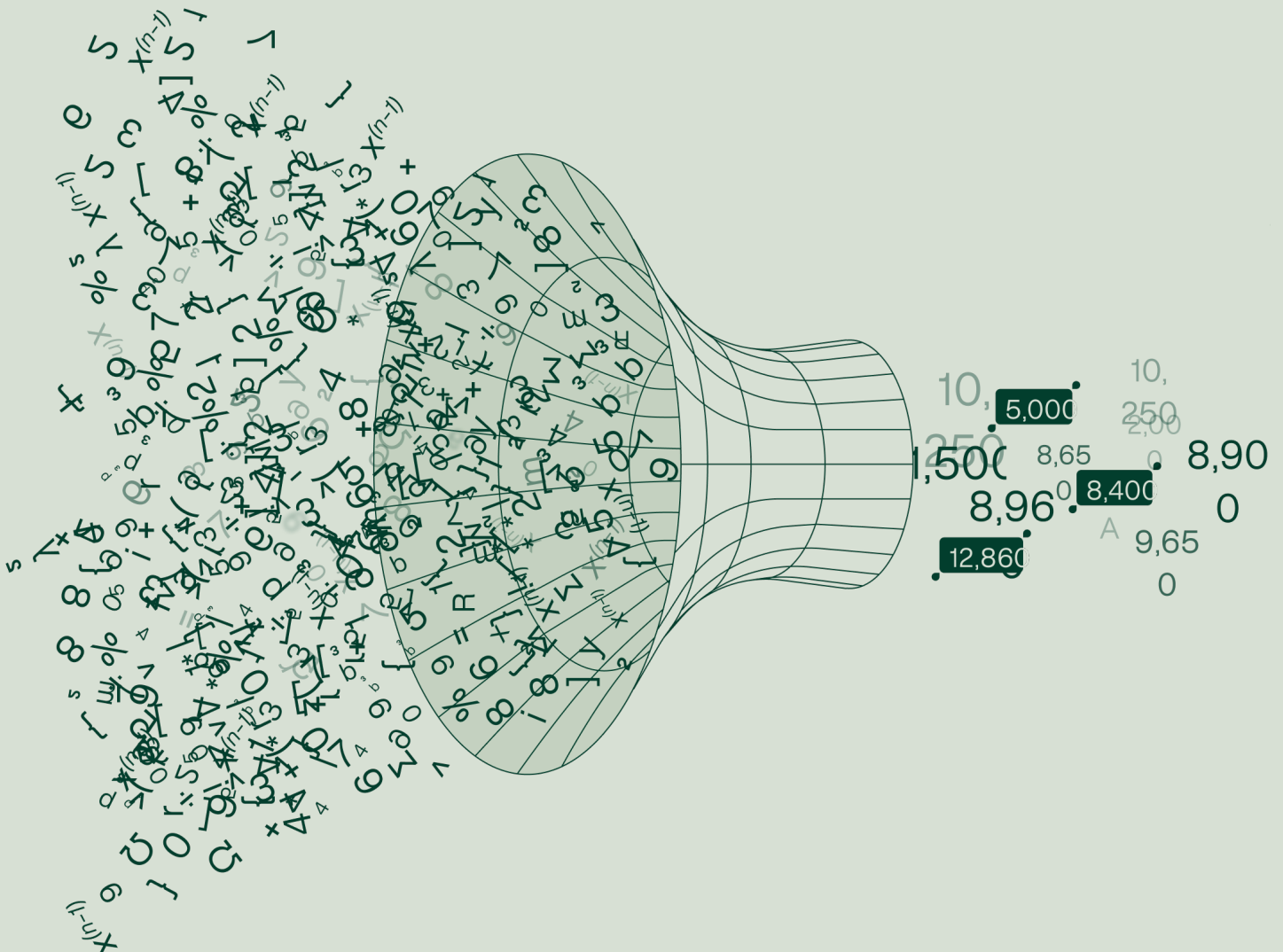


# Empowering Human Potential with AI.

The Future of Accounting



# Foreword

AI is here.

The impact on the accounting industry will be generational. In the most conservative estimate, we'll see continuous improvements over the next 10 years during a gradual transition phase. In the most aggressive scenario, the industry will change within a couple of years, disrupted by AI-powered business models and tech innovation.

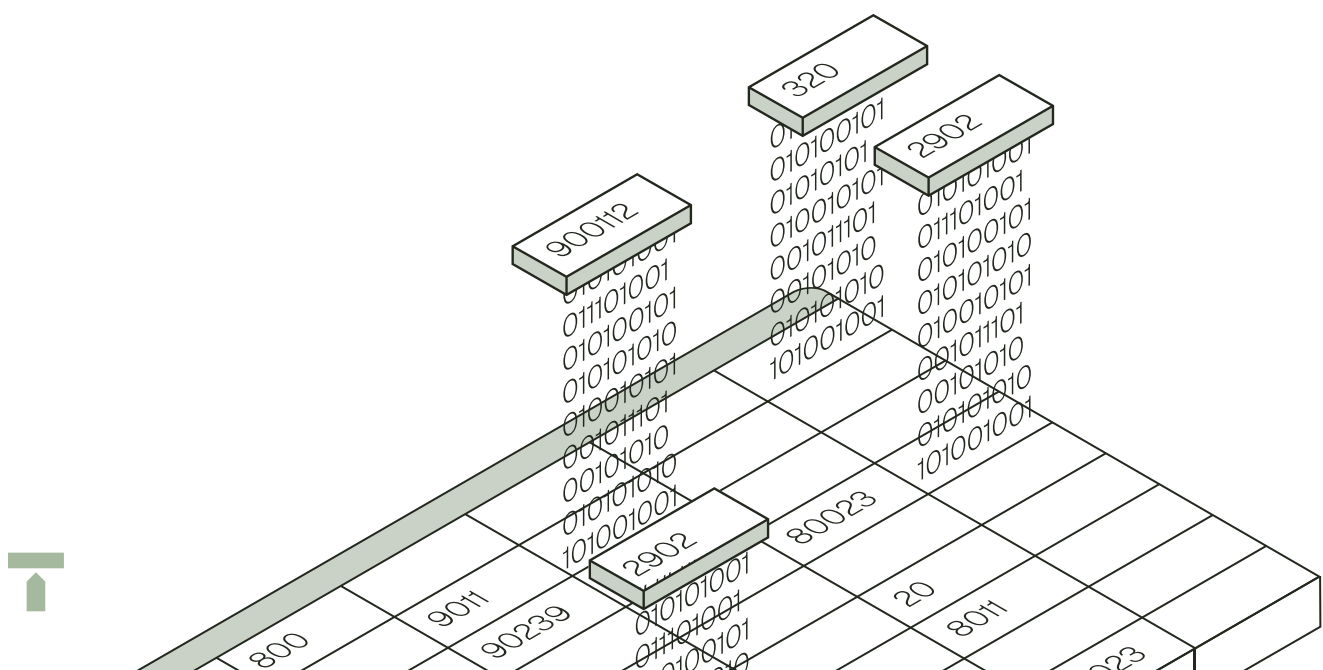
The fear of AI often forces us to look within. How will this impact me? And my job? Yet we overlook a more important question: What are the core principles of accounting? How can I advance my industry? Why did I get into this profession?

If we focus on the future of accounting, we appropriately reframe the discussion as it should be: the human—as always—in control, the AI (like new technologies before it) as a tool.

The one caveat: AI is a more powerful tool than anything we've encountered before. And it's perfectly positioned to accelerate knowledge-based and services-oriented industries like accounting.

Our goal in this paper is to provide a light framework for our customers and community as we wade into the generation of AI. We hope you'll join the discussion.

Isaac Heller, CEO & Co-founder  
Amir Boldo, CTO & Co-founder





**"Any sufficiently advanced technology is indistinguishable from magic."** –Arthur C. Clarke

## AI in accounting: why now?

On March 14, 2023, OpenAI announced GPT-4, which they say “exhibits human-level performance on various professional and academic benchmarks.” Yet the drive for AI in accounting rises from fundamentals much deeper than the shock that ChatGPT is creating.

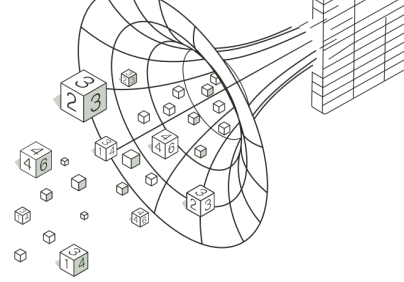
A constant demand for increased scope, volume, and accuracy is pressing on the accounting industry. And it’s getting harder. Increasingly complex business models and accounting regulations leave a gap to be filled.

But this gap is not going to be filled in the form of additional labor hours.

The next generation of college graduates is saying that loud and clear. In fact, many are opting against the accounting and audit fields, searching for better work-life balance and more dynamic roles in other quantitative fields—areas where AI is making everything a little bit easier.

AI is actually forcing us to deepen our understanding of the principles of accounting—not the reverse—while learnings from other tech revolutions can help us paint a bright picture of what accounting might look like in the future.

Is it time to buckle up and embrace these changes? Will this mindset shift encourage new generations to pursue careers in accounting? At Trullion, we certainly think so. More on that below.



## A brief history of tech innovation in accounting—where are we today?

The adoption of AI in accounting is already underway, given the industry's tech-forward nature, and the industry's respect for efficiency, accuracy, and dependability. But we're on the brink of a fundamental transformation that will have a more far reaching impact than any invention in recent memory, including the cloud.

Let's go back to the 1980s and 90s when database technology was a game-changer for accountants. In 1983, Scott Cook, the founder of Intuit (formerly Quicken), recognized the potential impact of personal computers on traditional accounting practices that were still paper-and-pen-based.

In the 2000s and 2010s, the industry embraced cloud software solutions, offering powerful synergies for an industry founded on strong client-partner relationships.

Fast forward to the present day, and cloud-based software solutions such as Quickbooks and Xero are providing accounting firms and small businesses with global access to their data—all in the cloud.

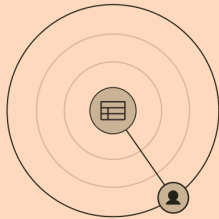
Today, we're embracing AI, whether or not we recognize the reality. Recent breakthroughs in Natural Language Processing ("NLP") and Large Language Models ("LLMs") show an unprecedented impact on the efficiency and accuracy of business applications.

NLP enables machines to interpret human language in order to facilitate communication. Think of software that reads invoices, or customer service bots: those are powered by NLP. This technology works best at understanding the narrow context of the word, or conversation.

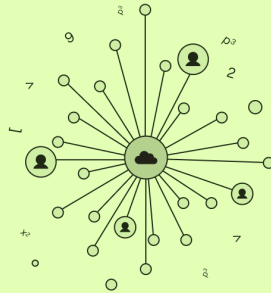
LLMs are much wider in their scope. They allow machines to learn and understand broad contextual language in real time, enabling them to provide natural, conversational responses. Other applications include automated document analysis, summarization, automated translation, and transcription. All of these applications open up new vistas to speed and scale.

## The Evolution of Data-Access Architecture

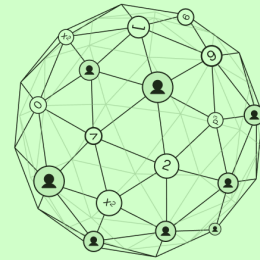
Database



Cloud



AI



By taking a closer look at **why** we need technology, we can better control the narrative of **how** we adopt it.

## Why we need AI: a data-led perspective

In the days of databases and clouds, data interactions were a bit like a game of ping-pong in 2D. First, only individuals could access data, then libraries of data began talking to each other in the cloud.

With AI, we're stepping into a 3D world where data relates to other data in a rich, contextual way, bringing new insights from a wider coverage of information than ever before.

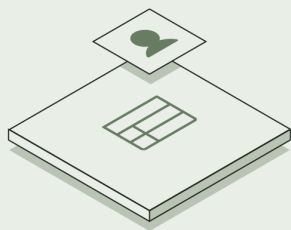
Consider this: on average, less than 10% of auditable financial data is stored in the GL/ERP.

AI has the unique ability to unlock new troves of data.

What's most exciting is the level of insight in this new era. These nodes generate even more data from their interactions, leading to an explosion in information volume and scope.

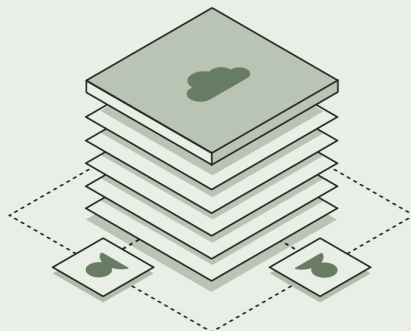
Suddenly, that unstructured data is now accessible, with the potential to fuel a new era of human strategy and insights. Cool, right?

## Evolution of financial data systems



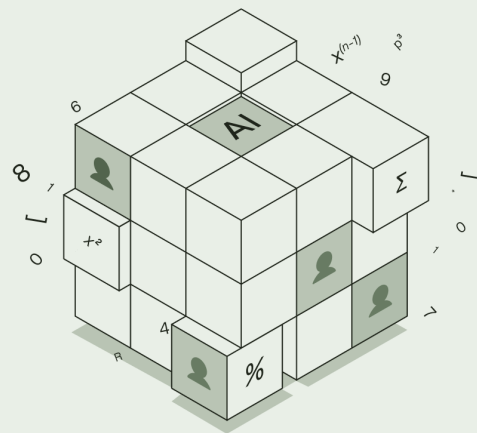
### 01. Person to data

Organization of Balance Sheet, Income Statement and Cash Flows (the era of technology breakthrough)



### 02. People to data

Proliferation and access (more people can access the data - a distribution breakthrough)



### 03. Data to People

Rapid acceleration of manual data entry, expanded coverage of auditable world (business model evolution)

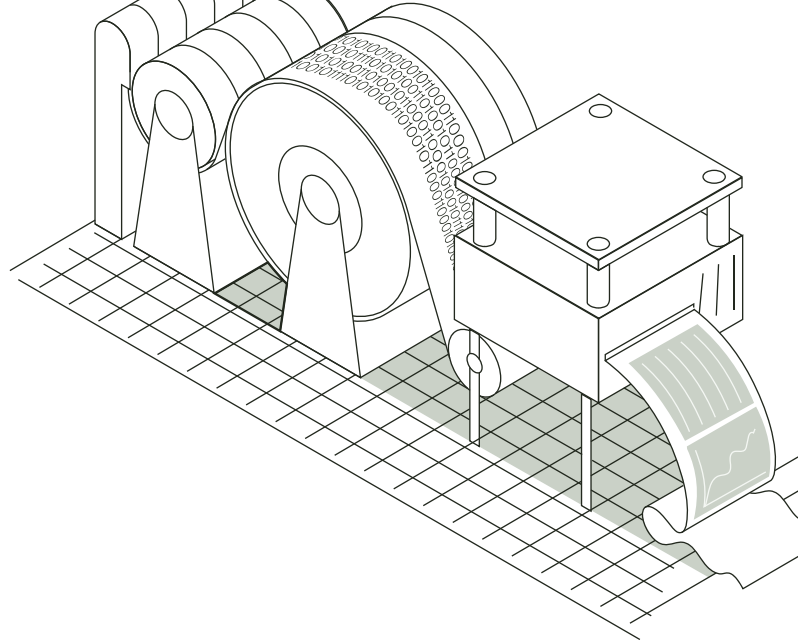
So, is AI taking over the manual work of humans, freeing our time for strategy, or is AI contributing to the strategic level itself? Clearly both, and everywhere in between.

At the most basic level, AI can automate repetitive tasks and functions, saving time and increasing accuracy. At the advanced level, AI can connect data points, infer meaning and relationships between them, and deliver insights, outcomes, and red flags instantly.

In the era of the cloud, humans became attached to their computers, and spend much of their time within software. In the era of NLP and LLM, AI will start to handle a lot of that work, and humans can once again spend more of their time with other humans. And, the additional conversations between humans become another element of unstructured data itself, in an ever-widening scope of visibility.

Frightening as it may sound, that leap forward can be imagined as one that we lived through in the transition from local book libraries, to the ubiquity of the internet. For some that was exciting. For others, perhaps a little intimidating.

The key is to embrace a balanced narrative around AI. Not one full of hyperbole or rhetoric.



## Is AI up to the challenge?

Two important factors inform AI's usefulness in any given field: scope and accuracy.

Scope refers to the range of tasks that AI can perform. Can it handle a small portion of the work or the entire workload? On the other hand, accuracy deals with how precisely AI can perform a task compared to human capabilities. Can it do the job almost as well as a human (90% accuracy), exceptionally well (99% accuracy), or even flawlessly (100% accuracy)?

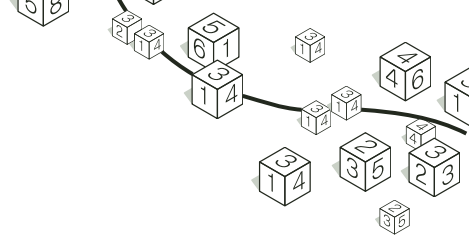
Accuracy is crucial at every stage of the accounting process, but the ultimate question is when accuracy will outpace or augment the results that accounting firms and businesses need.

## The lesson of cost-benefit analysis from other industries

Let's take autonomous driving as an example that epitomizes the sensitivity of lives risked and lives saved. Once AI is able to be 'aware' of the scope of information that matches and exceeds human potential, then the business case becomes viable.

It's easy for us to imagine the advantage of multiple sensors mapping the proximity of our car to everything else around us from multiple angles, constantly checking the speed and assessing the risk of contact relative to our speed. This is scope. Accuracy, on the other hand, could be calculating time to impact (and preventative braking) for a lane assist system.





Now let's look at an example from healthcare. AI-powered cardiac wearables provide early indications of arrhythmias, empowering patients to share real-time data with their care providers. The industry has set medical and ethical benchmarks by limiting detectability to a narrow range of illnesses with high accuracy.

The cardiac wearables market has already exceeded \$1.7bn in sales and is projected to grow at 26.5% CAGR through 2020-2027. Finding a path forward that meets medical, ethical, and consumer alignment around the technology means countless lives can be saved each year. Waiting for AI to meet all cardiac event detection criteria would result in poorer outcomes.

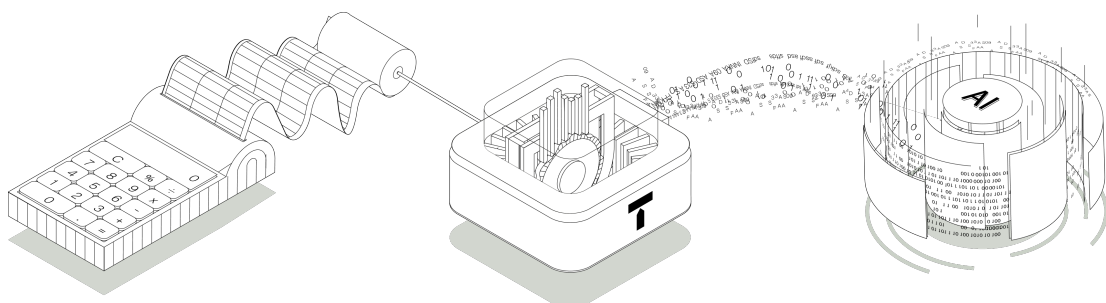
While accounting doesn't carry the same direct weight of lives at risk, we've seen situations over the past year—from fraud to crypto, and most recently the collapse of Silicon Valley Bank—that show the need for additional confidence in our financial reporting for continued stability.

## How will our community embrace AI?

The extent to which we embrace AI divides the accounting community into two camps. Let's imagine each end of this continuum through the eyes of Susie on the left, and Xavier on the right.

Susie is a reputed, respected, and accomplished professional who takes pride in her expertise honed over decades of experience. She is at one with Excel, has faith in the process, and is weary of technological advances.

GAAP is an anchor point for Susie's regulatory compass. Standards capture all that compliance entails. At times there are crunches in her manual methodology. At times staff is hard to find or slow to train. But for Susie, this struggle is the way to all mastery. So far at least, her system has worked.



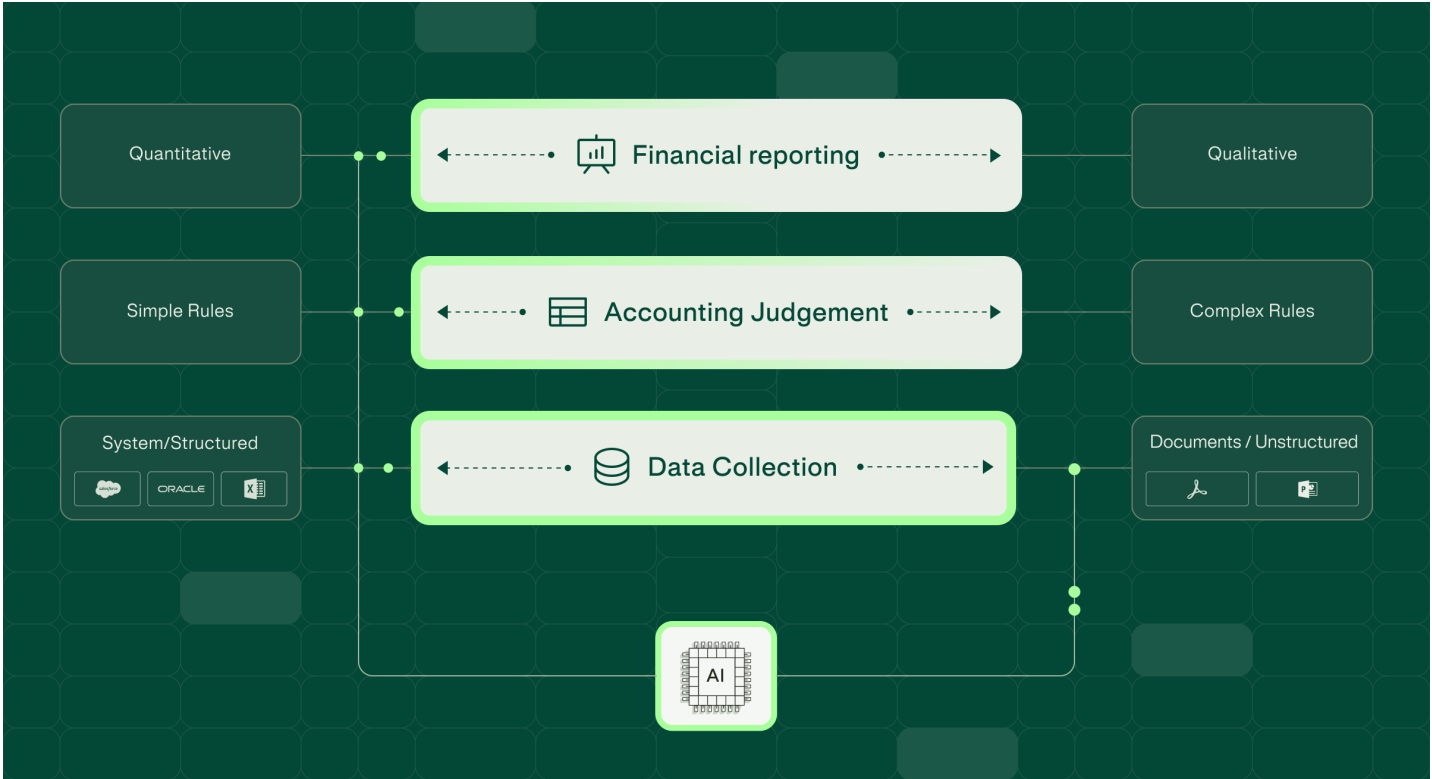


On the other end of the spectrum is Xavier. He’s a technophile. He understands and trades crypto, loves AI, and thrives on all things tech-forward. He’s moved on from Excel wherever macros have felt static and staid. He can't stand having to manually adapt and adjust contracts and values, balances and disclosures across multiple silos of unstructured data.

Xavier leverages tech that gives him the most important stuff instantly, from anywhere. And when it comes to preparing financial reports and disclosures, they’re few clicks away—accessible in real-time by his entire team, and external stakeholders. Xavier is forever on the hunt for the next iteration of software to end the pain of institutional complexity.

## Where AI will have the most impact

Accounting is a broad and diverse industry. For our discussion, we’ll focus on the corporate, audited, financial reporting world. An accountant's job broadly covers three vertical functions, with a range of data complexities across each layer.



## Data Collection

The beginning of many accounting workflows is all about gathering data from various sources and in different formats. This process can include gathering data from billing or customer relationship management systems or even piecing together Excel files from across the company every month.

Sometimes the data is structured and easy to work with, but other times it needs some cleaning up. Occasionally it's completely unstructured, like in the form of invoices or contracts.

When dealing with highly structured data and systems, the demand for AI is lighter, since the data is already clean and organized. But as the data set grows, so does the potential for anomalies and the need for machine learning models to help identify and match transactional data, such as a purchase order to a payment source. AI can also assist with pattern recognition and event validation.

As we move towards collecting more unstructured data, AI can help compare and align multiple data systems in real time. Imagine checking CRM data against sales contracts with the help of NLP to convert the contracts into readable data. AI can notify us of anomaly detection, or information validation, which once required many hours of manual work.

Finally, AI and NLP can also help extract data from the unstructured world of files like PDFs, spreadsheets, receipts, and invoices. AI is well-established in the area of AP invoice reading, RPA, and receipt collection. But as we've seen with ChatGPT, advances in NLP are rapidly accelerating AI's capabilities within more complex documents, such as sales contracts, financing agreements, and even board decks.



“Leveraging data to generate further data is a core tenet of AI. We can enrich unstructured and structured data to arrive at new models, which in turn reveal informational as well as actionable insights that would never have been visible from the initial data points. The potential is truly above and beyond the scope of any manual approach.”

**Shlomo Agishtein, Trullion AI Team Lead**

## Accounting judgment

The question on everyone's mind is, where can we draw the line between human judgment and AI?

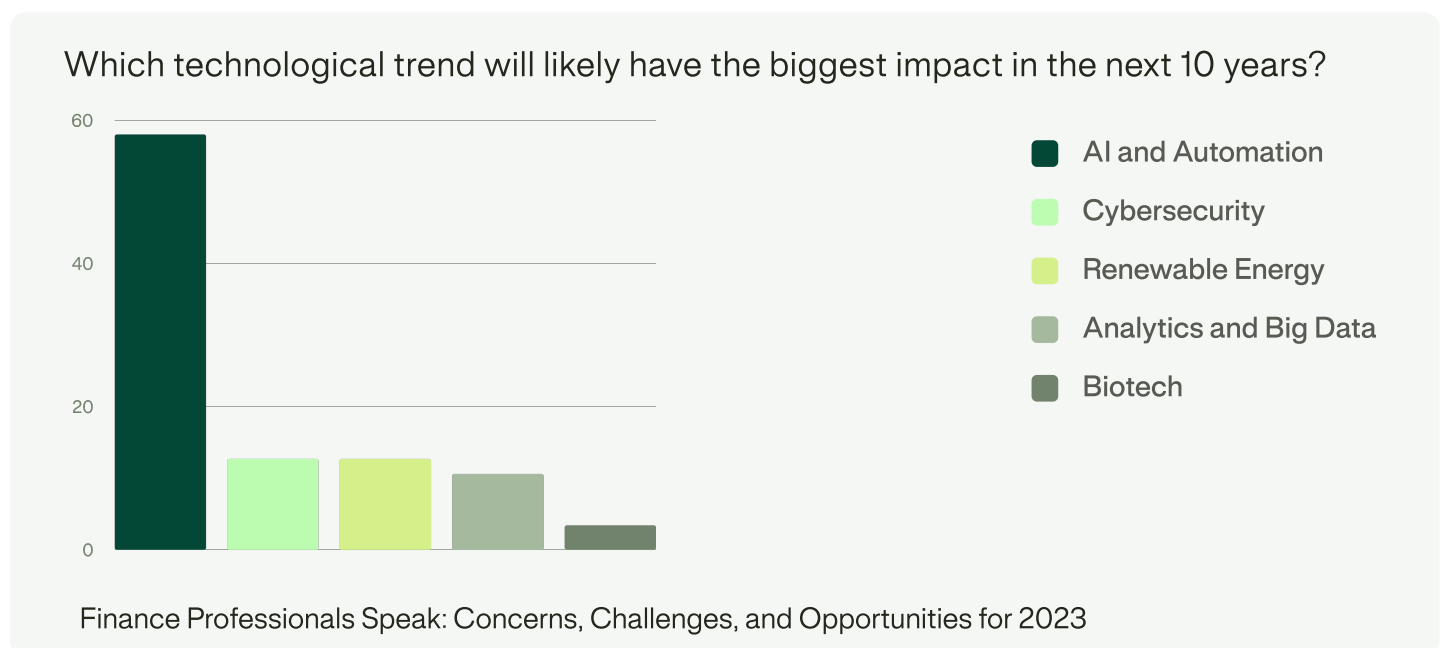
It's no secret that AI is already streamlining the mundane and time-consuming tasks of high-volume QA. With its ability to handle large data sets, AI can detect even the most subtle signals that humans may miss, making way for anomaly detection and boosting accuracy.

AI can also validate data and bring third-party verification to the workflow, a potential game-changer in substantive testing. Consider the potential benefits of real-time validation of payments through the integration of external source data, such as banking records, supplier records, and related financial records.

While AI may struggle with complex judgments requiring professional assessment, the technology can support strategic work by automating the groundwork. Accounting professionals will gain time and mental capacity to focus on complex rule-based analysis, knowing that AI has their backs on simple rule-based tasks. Not bad.

## What accountants and auditors are saying

In a 2023 survey of finance professionals across a range of industries, respondents projected that AI & Automation will have a bigger 10-year impact than Cybersecurity, Analytics and Big Data, Biotech, and Renewable Energy combined.



## Financial reporting

Financial reporting follows strict guidelines for output. From the quantitative to the qualitative, reporting standards are set under GAAP (Generally Accepted Accounting Principles).

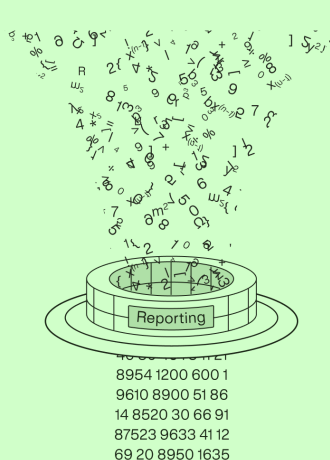
While this area may seem static and resistant to change, AI can still play a valuable role in verifying and validating financial reports.

But the strongest impact of AI will be the foundations of data collection and accounting judgments that the financial reports rely on, as opposed to the actual reporting generation.

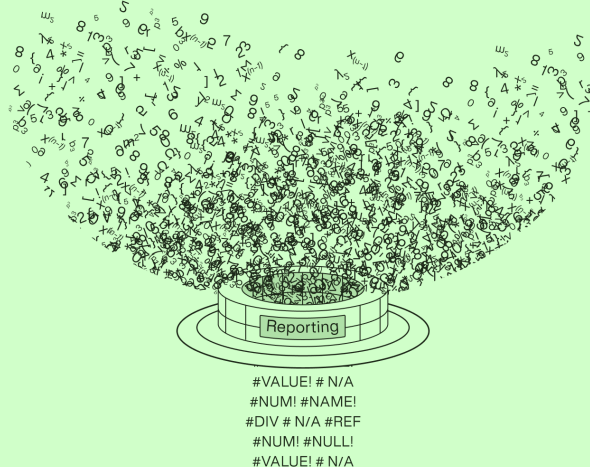
So where will AI start to impact reporting directly? By cross-referencing data and judgment layers, AI can provide an additional layer of accuracy and insight. With machine learning, AI can even anticipate potential outliers in reporting outputs, allowing for more precise and reliable financial reporting. This is made possible, in part, by capturing and relating to the widest possible scope of information. AI can accommodate the entirety of business data under review. There's no bottleneck or information overload as compared to manual methods.

In fact, there's almost no limit to the reporting and analysis capabilities of an AI-driven workflow. In the traditional framework, the reporting infrastructure becomes a bottleneck, exposing the entire process to delays, inefficiencies, and compliance risk.

### Reporting Workflows Must Adapt



Traditional Reporting Framework



Overwhelmed Traditional Framework

# A practical use case: A closer look at lease accounting

Let's take a lease accounting workflow, and show how AI supports the acceleration and accuracy of that process.

## From Manual to AI - Lease Accounting

Process	Requirement	AI added-value
Contract Centralization	Bring all relevant documents into a single workspace.	Automated file import, duplicate exclusion, and format normalization ready for extraction.
Data Extraction	Identify consequential clauses, date values, amounts, property information, parties to the lease(s), and the impact of these on the accounting calculations.	Ability to identify consequential clauses, lessor and lessee details, dates, amounts and related values both tabular and non-tabular, across multiple contracts instantly.
Audit Trail	Track both source data and authorized operator against decisions and changes to data points and actions.	Automation of data and operator journal to both log actions, and identify ownership at each step of the workflow.
Modifications	Changes to contract end dates, payment terms, and the like must be logged for their impact across all subsequent periods.	Instant modification of downstream dates and values, in addition to the identification of contract elements that might be overlooked by humans in a manual spreadsheet process.
Audit Ready Output	Generating financial reports to meet compliance standards.	Automation provides for the one-click generation of reports required by the chosen standard(s).

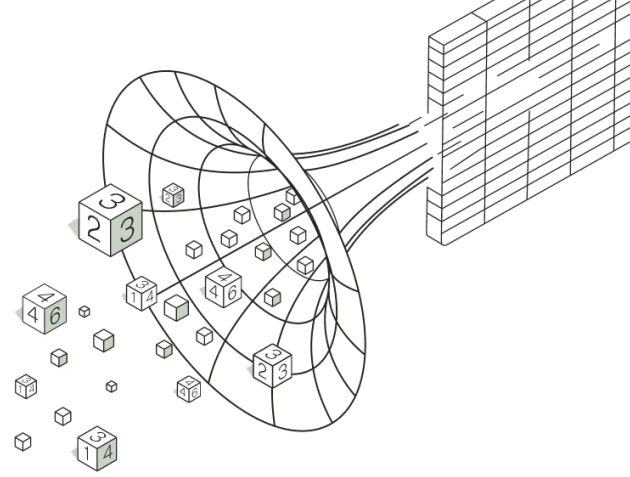


We've explored the broad role of accounting and how AI can support and accelerate many—but not all—of the core day-to-day functions. Naturally, the promise of technology extends into some of the tasks and functions that auditors are concerned with too. For example:

## From Manual to AI - Audit

Process	Manual	AI-enabled Automation
Test of Details	Intuition and experienced judgment are required to hone in to the most relevant samples and selection choices.	Automated API data extraction methodologies enable all relevant data sources to flow into a unified platform where AI can test data automatically without the need for user intervention.
Test of Controls	Humans must be familiar with the business models, modes, methods, and norms to ensure regularity of control and management oversight	NLP and Anomaly Detection models can identify potential irregularities.
Review of Financial Statements	Experienced professional auditors review financial statements, to ensure that they 'add up' assessing them for any signals of concern, which can be difficult to detect at scale to even the most highly trained eye.	AI can support judgment validation and data integrity (anomaly detection), memo generation and facilitate secure document collaboration.
Risk Analysis	Manual financial and management review and assessment.	AI-empowered automation supports the review of historical transactions using ML to build models that assess elements of risk, from a statistical viewpoint.





## Final thoughts

The pace of business is getting faster and faster. Data complexities are growing. The gap between manual risk assessment in financial reporting and our collective level of confidence in financial data is growing.

**Humans need to fill that gap.**

AI is both accurate enough and reaches enough scope to be making a greater difference – empowering humans to focus on strategy. But people need to push AI so that AI will push us forward.

## About Trullion

Trullion is an AI-powered accounting platform that automates repetitive, labor-intensive tasks for CFOs, Accountants, and Auditors to ensure hassle-free compliance. Trullion unifies the unstructured and structured worlds of accounting into one secure platform, giving you back your time, with confidence.



[www.trullion.com](http://www.trullion.com)



[info@trullion.com](mailto:info@trullion.com)



Disclaimer: The content, data, opinions and illustrations presented in this article are the intellectual property of the authors. This article is intended for informational purposes only.