

## Foresight: The CPA Podcast

### Season 2 Episode 3: CPAs and the double-edged sword of Technology

**David McGuffin:** Welcome back to Foresight, the CPA podcast. I'm your host David McGuffin. When Rachel Kirkham completed her exams and received her designation as a professional accountant in the UK, it wasn't obvious she'd end up leading and in fact, designing massive AI projects.

**Rachel Kirkham:** I'm not sure, I quite had appreciated I'd end up joining like a software company and kind of building AI software, but that's the way it's gone.

**David McGuffin:** In fact, the first step she took after receiving the designation was not into a tech startup or anything techy at all really. Her first job was in the mother of all audit offices, the national audit office, the UK equivalent of the federal auditor general. Rachel was auditing the national tax authority.

**Rachel Kirkham:** And as you can imagine, they have a lot of data.

**David McGuffin:** The UK collects on average 650 billion pounds in tax revenue every year. And the information for this was spread over 200 separate IT systems. The task was enormous, and it was at that moment as she looked at the incredible mass of data and wondered how she was going to sift through it, all that she thought she needed some new skills.

**Rachel Kirkham:** I thought I really need to learn to program so that's when I, I started teaching myself to program actually.

**David McGuffin:** And so that's what she did Rachel learned to program and to apply machine learning to enormous data sets of financial information. And this is where her journey from a recent accounting graduate to the vice president of analytics and data science for MindBridge became a little more obvious MindBridge is a software company that uses complex AI to audit complex financial data.

It's AI for accountants. Rachel has been at the center of developing the tremendous opportunities that AI brings to accounting, but she's also had to navigate its potential ethical pitfalls. Laura and Brian Friedrich call this wedge between the promise and the perils of technology, the double edge



sword. We'll speak to Laura and Brian later in this episode, but first let's return to Rachel. We'll pick up her story at the first time she used AI in her role as an auditor.

**Rachel Kirkham:** Funnily enough, like the first real machine learning I remember using wasn't for a financial audit. It was for a performance audit. So our value for money audit and we were trying to synthesize large volumes of text into something that was actually usable for a study. We were using natural language processing to pass that text and then build topic models on top of it, identifying the key themes within the data.

You can also apply sentiment analysis once you've done some of that pre-processing. So looking at how positive and negative people's opinions were of particular government services. So that was super interesting and text isn't always the kind of data people think of when they do an audit, but it's actually really valuable. So that was the first like real machine learning project I can point to.

**David McGuffin:** Was there, I'm just wondering if there's a particular like aha moment. Like, "Wow, this is really powerful."

**Rachel Kirkham:** I think when we started to look at automating something that takes a really substantial amount of time often in an audit, you're probably doing a hundred to 500 samples, maybe more depends on the size of the audit and kind of the levels of risk, right? Being able to demonstrate you could use that technology to perform what lots of junior auditors were doing possibly quite inaccurately if they're like first year trainees.

I think that was really an aha moment for me. And when I was looking for kind of new opportunities, MindBridge was like a super obvious from my perspective, because we'd done a proof of concept with them and meeting people like Robin who's our chief technology officer really reinforced to me that like, technologists were thinking about audit in a very different way and I wanted to be a part of that.

So that's why I joined MindBridge and looking at kind of the projects that we do here, there's a really interesting set of machine learning algorithms that can be really powerful actually in identifying unusual behavior within data.

**David McGuffin:** Yeah. I mean, just talking about that power, I'm wondering also if there's been like an uh oh moment as well, like, "Whoa, this is really powerful. How do we manage this power?"

**Rachel Kirkham:** Yeah. So when you're training a machine learning algorithm, maybe to credit score someone in order to decide whether you're going to give them a loan, right? Like what characteristics of that person do you include to the machine learning model? How do you make



sure that you are not simply replicating the bias that already exists within the system by feeding it in data that already contains that bias?

So there's like a bunch of considerations you have to take when you're developing those models such that you don't end up replicating the systemic bias that already exists in society. And I think a lot of people are aware of this. There's certainly a greater awareness than there was even five years ago of some of these subjects.

I have quite strong opinions around facial recognition and that lack of diversity and data science, being something that needs to be address in order to make sure that these technologies serve everyone and not just a few people. I think that the broader societal impact of AI is still to be determined and there does need to be concerted efforts across the technology industry to make sure we address those.

**David McGuffin:** Can you program against bias? Is that something you can actually do?

**Rachel Kirkham:** So there are ways you can, pre-process the data essentially to minimize bias in that data set. Yeah. So there are specific approaches you can take. You also, the feature selection. So which characteristics of the data you feed into the algorithm that itself can help to mitigate against some bias.

But sometimes it's not just the explicit characteristics that are protected by the law that you need to consider. Sometimes some of those characteristics are actually implicitly included in other kinds of data about that say person, for example. So there are a bunch of different things that you have to think about, and the techniques to mitigate against these biases are improving all the time. Yeah. So I think there are things you can do, but it's about being aware of them as a data scientist, I think.

And also if you are managing people that are building these models, it's having an awareness that this is something you actually need to explicitly consider and manage as a risk, right? So it comes back to risk management and kind of as an auditor, obviously risk management is close to my heart. So I think, there is lots of evidence about the potential harm of improper use of this technology. So now is the time for people to put appropriate frameworks in place to manage this from a corporate risk perspective, as well as a regulatory perspective.

**David McGuffin:** Yeah. In terms of face recognition software, you mentioned concerns and sort of benefiting the few against the many. Can you elaborate on that?

**Rachel Kirkham:** Yeah, sure. So there's some classic kind of case studies in facial recognition, algorithm being unable to accurately identify ethnic minorities because the training data sets that



they've used have predominantly included Caucasian faces in their training. And I think, and to be honest with you, it's not just, ethnicity. I think they still struggle sometimes with women versus men, for example. And it's something which actually from a kind of, if you were to stand back and look at their perspective, the way the algorithms work, it's predicated on the data that you put into the algorithm.

So if you are not giving it a balanced data set, then it's not going to have a balanced result. So it's actually something that's really quite obvious. But if you have people that maybe you don't have a diverse team working on that project, they just might not spot it. It's not even necessarily malicious. It's just that they haven't noticed that actually the data set they're using for training purposes is potentially biased. So there are strategies you can take to mitigate against these risks, but you need to have people thinking about it right. In order to be taking those steps in the first place.

**David McGuffin:** It's fascinating. It really is. I mean, you talked a bit about what you're doing with AI at MindBridge. I'm just wondering if you can elaborate on projects that you're really excited about or been working on.

**Rachel Kirkham:** Yeah, yeah. Sure. So if you think about audit as a way to provide trust in a system, right? So financial reporting is used for a couple of different things, but it is primarily there for shareholders and in the case of obviously government financial statements are there to reassure certainly parliament, but also the taxpayers that their money's being spent appropriately audit's there to increase trust in those processes.

And to give you comfort around the numbers, from that perspective, being able to provide a higher quality, more insightful audit for me just seems like a number one priority. I think because of the cost pressures in the audit market, particularly because there's been a massive increase in the amount of data that enterprises are producing, it's very hard to be able to look at all the transactions based on traditional audit approaches, but you can with algorithms and data analytics.

So for me, it's something I'm quite passionate about, to be honest with you, like firms should be using these techniques to improve the quality of their audit and making sure that they're really looking at the things that are genuinely high risk. So we use a range of anomaly detection techniques to say, Okay, this is based on the data that you've uploaded into our system, this is the most unusual thing. And say, you're looking at the interaction between account codes so we can identify what the rarest occurrences are.

And those are probably they might be error collection journals. They might be a journal you only post once a year. But nevertheless, they're still potentially the things that you want to spend some



time looking at I would say, and we're in the midst, we're in the kind of middle of a project where we're expanding the range of different data sets we can bring into the product.

So we've done a lot of work on the general ledger, but actually in audit, there are loads of other data sets that you collect, payroll analytic come to mind. At my previous time, we did a lot of work on purchase to pay. So that's a business process. We were really looking at kind of through a matching and understanding, is there a regular expenditure in that data set? Have things been approved via a purchase order? Have you received all the goods, that kind of thing.

But being able to do those analytics and actually say everything has been through a three way match. So it's gone through the process correctly, and these are the 20 most anomalous items in your entire data set and then go and evidence those. You're actually getting a lot more assurance through doing that process through analytics rather than maybe just doing a random sample on your invoice listing. And you have no idea right. Whether you're targeting the right ones. So I guess, I think for me, it's all about like improving audit quality, but then also increasing the trust in those financial statements. So being able to do a better audit.

**David McGuffin:** So you've actually audited algorithms, right? I'm just wondering what that involves.

**Rachel Kirkham:** Well, so I have actually done that in the UK. University College London have really good computer science department, but they'd also actually been publishing quite a bit on the auditing of algorithms. So we got them in to apply their framework and audit our algorithms. So we took a glass box approach, which is where we give them access to all of our algorithms with test data. And they spent a lot of time testing the algorithms themselves.

They created their own test data. And so they were able to verify that how we described the algorithms to non-technical users was actually how they operated. So that was a really great outcome. It's probably the first time a software provider has actually been through algorithm audit, certainly in the audit market for software and it's something we will continue to do on an annual basis, much like we do our SOC two type two and our ISO 27,001 reports because it's part of our kind of control framework.

So I think that should give a lot of comfort to firms that are using us, especially with reference to the new standards. But actually when I was at the NAO, I also did do some audit of algorithms as well. So it's definitely an emerging field. And I was working with some colleagues in, in Europe on a framework for the audit of algorithms. So there are a couple of different approaches out there and in the UK, the information commissioner's office is going to be publishing an auditing framework, actually. So there's a lot of discussion about it here in the UK-



**David McGuffin:** You mentioned the outside audit. Were there any surprises that came out of that?

**Rachel Kirkham:** Not really. I think it was very helpful from a kind of having a third party look at our documentation and look at our algorithms. And they had some like pointers about things we needed to update some of our customer documentation. You know that was a good outcome. I think I was surprised actually how robust the audit was. Don't know why that should surprise me, but they really did do a lot of testing. And they gave me a lot of their kind of example data. And so, yeah. So I think that was reasonably challenging definitely [crosstalk 00:13:51]

**David McGuffin:** You were happy with the outcome clearly though.

**Rachel Kirkham:** I was, yeah.

**David McGuffin:** Yeah. So in terms of sort of balancing opportunity versus risk, what do you think chartered accountants need to think about to navigate that risk?

**Rachel Kirkham:** I think for me the biggest risk in the use of technology AI maybe specifically is people trusting the results without really thinking about the inputs. So I often see people blindly applying a color that's been applied to a particular transaction and being like, okay, that's fine. We will do this or we won't do this, but there's no critical thinking about like, what does it actually mean.

And so I guess for me, that's the biggest risk, right? Is that people take analytical approaches, but they're not then applying critical thinking to the results. And so one of the advances of using these technology is that you can standardize your approach to audit to a significant degree because it's repeatable and you just need to put the right data in there and it will run all of the analytics for you. That's a great thing to be able to do, but then you don't have the auditor performing all of those calculations. So they have to actually still think about, okay, I've put this data in, is the data of sufficient quality? People don't necessarily always do that, right.

I actually see a lack of critical thinking about, have I done IT general controls testing? Have I considered the provenance of this system generated report? Is it complete? These are like some critical things you have to do in audit anyway. And I think people forget about them, but the more that you use analytics to automate a fairly significant chunk of audit, the more that these become crucial. Because this is the source of your audit evidence. So you knew you better be sure that the report that's been run is pulling everything from the data set. So, yeah. So that's-

**David McGuffin:** That's fascinating.



**Rachel Kirkham:** That's a bit of a risk and I say I've seen that quite a bit. And I'm like, why do the audit work you do?

**David McGuffin:** Yeah. I mean, a lot of what you've described in a lot of your work that you've described involves a heavy amount of tech, obviously in programming. And I'm just wondering, you're also obviously a chartered accountant and how important those CA skills came to play in doing what you're doing.

**Rachel Kirkham:** Yeah. So I think from my background, there's a couple of different aspects. So the construction of transactions is obviously double entry bookkeeping. So that's fundamental. So, I still see people struggle with like the fundamentals of accounting, especially my data scientists who aren't accountants. They've got a bunch of accountancy training and I think sometimes like the conceptual underpinnings of the data that we're looking at, takes them a little while to get hold of.

So I think that's important, but also, and maybe this is because of the nature of the audit work that I was doing, but we often took systems based views. So I did do a bit of IT audit training as well. And so I think having that backgrounds and understanding how these IT systems actually fit together to produce financial information, that's been pretty foundational in doing kind of the rest of the work that I've done.

**David McGuffin:** Yeah. Interesting. Listen, this has been such a fascinating conversation. Thank you so much. And you've been very generous with your time.

**Rachel Kirkham:** No worries. David.

**David McGuffin:** Rachel Kirkham is the vice president of analytics and data science for MindBridge. And as you heard, she's also a professional accountant. Now I mentioned at the beginning that Laura and Brian Friedrich have been thinking a lot about the cost benefit balance of AI. They wrote a report for CPA Canada called "Technology as a double-edged sword with both opportunities and challenges for the accountancy profession." They are friends of the podcast. And it's really great to have them both back Laura and Brian. Welcome.

**Laura Friedrich:** Thanks for having us back.

**Brian Friedrich:** Thank you so much.

**David McGuffin:** So Laura, maybe we'll start with you. Rachel really laid out the potential benefits and challenges with AI in her work. And I'm just wondering what you heard in there that really caught your ear.



**Laura Friedrich:** One of the things that really stood out for me was that when she was speaking, she spoke about that opportunity side, not just as an opportunity per se, but really a necessity. She was talking about the fact that as organizations generate larger and larger amounts of data, the ability for us to audit using traditional methods, well that's just gone now, traditional auditing is not going to work with those massive data sets.

And the same thing is true when we're speaking about professional accountants who are working in organizations, the larger and larger those data sets get that we're trying to manage, the more difficult data is for us to use some of those older methods of dealing with that data. And we really do need to embrace and harness and leverage the power of transformational or disruptive technologies in order to be able to continue to add value going forward.

**David McGuffin:** Laura, you mentioned the necessity of this. I'm just wondering what are the opportunities that you heard coming out of come conversation?

**Laura Friedrich:** Well, I think that in terms of those opportunities, she was speaking quite a bit about as professional accountants, as CPAs, we don't have all of the technology skill sets from our traditional training necessarily. But what really counts is some of the core skills that we do have some of that systems thinking, the critical thinking that professional skepticism or in an international context, we'd refer to it as having an inquiring mind.

And that piece, being able to work with experts who are sometimes very focused on what they're doing in the progress that they're making, but then to kind of bring that bigger picture out and say, "Okay, we're needing to look at this. And like let's take a step back. Let's make sure that we're asking the right questions here." And that piece of it is something that is so fundamentally important when we look at it from the opportunity side.

**David McGuffin:** Interesting. And Brian, what jumped out at you as the risks that most concern you?

**Brian Friedrich:** Probably a key risk being bias and mitigating bias in the systems that are out there. And I think we would agree that the biggest risk from transformational technologies is that people have a tendency to trust the outputs without really being critical about the inputs. So again, risk identification, critical thinking, looking at how outputs are driven by the inputs in systems and that systems thinking philosophy.

And that's something that CPAs are very well versed in understanding that the fundamental underpinnings of transactions is an important piece of this. And clearly, we're also trained to be skeptical and to have an inquiring mind in the language of the international context. And then if I





think about the audit context, Rachel highlighted the need are to ensure that we don't lose sight of audit fundamentals and IT general controls testing and that sort of thing is especially important when you think about the standards around audit quality and so on and as those change.

**David McGuffin:** Yeah. So, Laura, how does CPAs effectively navigate them between the risks and benefits?

**Laura Friedrich:** Yeah, that's, that's the ongoing challenge, isn't it for all of us in terms of really harnessing these opportunities. We need to be aware of the fact that as Brian was saying, we need to be aware of the risk of bias and ask those right questions. So not trying to put breaks on, but rather recognizing that these systems need guardrails, they need oversight.

And as CPAs we can offer that oversight, we can naturally, we're trained again to have that critical thinking and to be skeptical and to ask the questions and to be a little bit conservative in our approach to risk management, to say "Let's make sure we're doing this right and getting the right balance from that perspective".

**David McGuffin:** How optimistic are you that we're going to be able to navigate this correctly? Or is there too much forward momentum too much speed moving forward?

**Brian Friedrich:** It's a difficult question, I'm going to say it. And the reason is it sounds like a pretty simple question in terms of the optimism, except that it's a very complex question because any response has to be blended within the social context of what's happening in the world generally, and the MIS and disinformation and the different political agendas that are moving things in certain directions.

So certain actors make use of some of these very transformative and disruptive technologies for their own agendas. And so that's where my caution comes in because these technologies from everything that we've seen are moving largely at an exponential rate. And the human brain is very good at working in a linear fashion, sort of a proportional rate, but exponential becomes more difficult.

And so we really need to be making use of some of these technologies to serve as the controls for the technologies that we are looking to have oversight over, because we simply can't think as fast, we don't have the same sorts of resources or the same compute that these systems have. And so as CPAs, I think we need to be very creative about making use of the technology to both add value and to exploit the fantastic opportunities that are available through this, but also from the safeguard perspective, to ensure that the tech is being used in the right way for the right purposes, and always remembering your public interest mandate.



That's what has to be held above all else, certainly the legitimate interests of your clients, of your employer and so on. But when things start to look like they're crossing the line, or if there's a risk of them crossing the line that you're able to stand back and ask the important questions about what's this tech really going to be doing. And does it seem appropriate for us to do that? Has there been enough testing those sorts of things?

**David McGuffin:** Fantastic. Well, as ever, it's always a fascinating conversation when you two are involved. So thanks you so much for coming back on the podcast again.

**Laura Friedrich:** Thanks for having us.

**Brian Friedrich:** Really, really appreciate it, David.

**David McGuffin:** Laura and Brian Friedrich are co-leaders of the Trust and Ethics stream of CPA's Foresight Initiative, among many other roles and activities. There are links to their bios in the show notes. They were in BC.

If you are interested in learning more about CPA Canada's Foresight initiative, go to [foresight.cpacanada.ca/](https://foresight.cpacanada.ca/) We will also have that link in the show notes.

And that's it for this episode of Foresight. Foresight, the CPA podcast is produced by PodCraft Productions and please rate review and share this episode. It helps others to find the podcast. I'm David McGuffin, I'll be back with our next episode in two weeks time until then. Thanks so much for listening.