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AI AND THE FUTURE OF TAX

KEY TRENDS AND STRATEGIES FOR PRACTITIONERS

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Contents

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About Nick Stobbs and Paul Aplin

Nick Stobbs

Nick Stobbs is the co-founder of Tax on Demand, a UK-based AI company transforming the way accountants in general practice access specialist tax knowledge.

The UK has the most complex tax code in the world; 10 million words across 18,500 pages of legislation, supplemented by 217 HMRC manuals and 800+ tax cases. Today, the vast majority of this knowledge remains inaccessible. It lives in expert's minds, stuck in static formats and scattered across dozens of reference books. As a consequence, billions are lost each year in over/under-paid tax (clients) and lost fee-income (accountants).

Tax on Demand unlocks access to tax knowledge, making it accessible to every accountant exactly when they need it. Helping accountants work smarter, learn faster, and achieve more than they ever thought possible.

Nick regularly shares his insights on how AI is reshaping the future of tax, helping others understand and embrace this exciting shift in the profession.

For 'research preview' access to Tax on Demand's technology visit https://www.tod.tax/.

Paul Aplin OBE, FCA, CTA(Fellow), FRSA

Paul Aplin is a chartered accountant and chartered tax adviser. He was President of ICAEW in 2018/19 and is currently Vice President of CIOT. He was, for 30 years, a tax partner with an independent West Country firm. In 1997, he filed the UK's first electronic personal tax return and he has been involved in one way or another with virtually every taxpayer-facing HMRC digitalisation initiative ever since. He is a member of the CFE Tax Advisers Europe Tax Technology Committee, HMRC's Administrative Burdens Advisory Board and the GAAR Panel. He writes and speaks on tax technology, tax administration and tax policy. He was appointed OBE for services to the accountancy profession and for public service in 2009.

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About this guide

When ChatGPT hit the headlines in November 2022, few people in the world of tax and finance had ever heard of generative AI. Two years on, almost everyone has. But how do you distinguish the hype from the reality?

The purpose of this guide, which has been written with practitioners in mind, is to give an overview of what AI is and how it works and then to look at how AI is currently being employed in tax and at how it is likely to be used over the next few years. We look at how tax authorities are using AI chatbots to respond to taxpayer queries and at how they are using AI to identify tax risk and target enquiries. We look at how AI is employed in bookkeeping and accountancy software and at how software developers are looking to integrate generative AI into their products.

We also look at some of the biggest practical issues that practitioners face when stepping into the world of AI. What are the risks and how do you mitigate them? What are the ethical issues you need to have in mind? What governance should you put in place? How should your recruitment policy respond to the changes and what does the future hold for practitioners: is it redundancy or renaissance? We think it is very much the latter: the risks must be understood, but the opportunities are huge.

1 The power and promise of artificial intelligence (AI)

1.1 Introduction to AI

1.1.1 The evolution of AI: From concept to reality

Artificial Intelligence (AI) is rapidly emerging as one of the most transformative technologies in human history, poised to reshape our world in profound ways. Far from being a recent innovation, AI's roots stretch back centuries to Aristotle in 350 BC through to today's cutting edge applications. In this section, we will embark on a journey through AI's rich history, from its philosophical roots to its current state-of-the-art applications, and peer into its potential future.

As we explore AI's evolution, we'll examine both its immense promise and the complex challenges it presents. This understanding is crucial for everyone, including taxpayers and accountants, as AI increasingly permeates our daily lives and business practices. Those who grasp AI's significance and adapt accordingly will be well-positioned to thrive in an AI-driven world.

1.2 Defining key AI concepts

1.2.1 Artificial Intelligence (AI): What it really means

Artificial Intelligence (AI) is the broad and evolving field of computer science dedicated to developing machines and software that can perform tasks typically requiring human intelligence. These tasks include recognising speech, interpreting images, making decisions, solving problems, and even mimicking human conversations. AI systems are designed to handle both structured and unstructured data, offering the potential to automate a wide range of processes across industries. AI can be applied to specific tasks, such as diagnosing diseases or powering virtual assistants, or it can be used to solve complex, multi-dimensional problems that evolve over time. The true power of AI lies in its ability to continually learn, adapt, and perform tasks that previously could only be carried out by humans.

1.2.2 Machine learning (ML): Learning from data

Machine learning (ML) is a crucial subset of AI that focuses on the development of algorithms capable of analysing and learning from data, improving over time without explicit programming for every scenario. ML models learn from historical data (training data) and use statistical methods to make predictions or decisions when presented with new data. For instance, ML is the technology behind recommendation systems on platforms like Netflix and Amazon, where it analyses users' past behaviour to predict what they might like next. ML can be supervised (trained with labelled data) or unsupervised (working with unlabelled data), and its applications extend to various fields, including finance, healthcare, and marketing.

Key benefits of ML include its ability to automate repetitive tasks, improve accuracy in complex decision-making processes, and uncover hidden insights from vast datasets.

1.2.3 Deep learning (DL): Unleashing neural networks

Deep learning (DL) is an advanced subset of machine learning that leverages artificial neural networks designed to mimic the human brain's structure. Deep learning excels in processing large quantities of unstructured data such as images, videos, and natural language. These neural networks are composed of multiple layers (hence 'deep' learning), each layer learning increasingly complex patterns in the data. DL models improve their performance with the help of vast datasets and high computational power, making them the backbone of technologies like autonomous driving, facial recognition, and real-time language translation.

For example, in image recognition tasks, a DL model can learn to identify edges in the early layers, then shapes, and eventually more complex features like faces or objects in the deeper layers. This layered learning approach makes DL a powerful tool for solving problems that require intricate pattern recognition.

1.2.4 Generative AI (GenAI): The art of creating from data

Generative AI represents a cutting-edge branch of AI designed to create new content—whether it's text, images, music, or other forms of media. Unlike traditional AI models that focus on classification or prediction, generative AI models can produce original, humanlike outputs from the data they've been trained on. A popular example of generative AI is OpenAI's GPT models, which can generate realistic text responses in conversation, write essays, and even compose code. Similarly, image-based generative models, like those used in GANs (Generative Adversarial Networks), can create new images by learning patterns from a dataset of visuals.

The core technology behind generative AI includes transformer models, which have drastically improved the capabilities of AI to generate coherent, contextually relevant content. The transformative potential of generative AI lies in its ability to assist in creative fields, automate content generation, and even accelerate research and design in scientific fields by synthesising new ideas and solutions.

1.3 A journey through AI history

1.3.1 From ancient times to early modern discoveries

350 BC – Aristotle's syllogism

Aristotle introduces the concept of syllogistic logic, a form of deductive reasoning, laying the groundwork for formal logic and reasoning processes that would later be the foundation of AI development.