

# Augmenting Tax Judgment: A Critical Review of Artificial Intelligence in Tax Interpretation, Planning, and the Future of the Profession

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**Abstract:** The dual forces of regulatory complexity and economic digital transformation are tectonically shifting the existing global tax environment. In this space, the manual traditions of handling tax matters are simply becoming untenable, prompting the need for advanced technologies. In contrast, the present narrative review envisages the changes seen in the continuous grafting found in artificial intelligence cocktail of approaches to the tax world: from automation of tasks to augmentation of judgment. We synthesize literature and real-life situations to configure the AI's current role in compliance workflow automation, using natural language processing and machine learning. The review therefore considers an imminent disruptive frontier: AI generative applications in the interpretation of tax code and its planning, as well as predictive analytics. A core argument is how the advancement poses enormous opportunities and serious challenges; issues among them are the black box issue, ethics issues, evolving definitions found in professional expertise and algorithmic bias. The article proposes the tax practice in the future would not merely be based on automation, but rather of augmentation: a collaborative partnership in which AI addresses difficulty at scale, thus freeing experts from sophisticated judgment, ethical problems and counsels. The article thus articulate a key research agenda for guiding responsible adoption, all while stressing the importance of interdisciplinary effort that spans different fields like law, accounting and computer science.

**Keywords:** Tax, Artificial Intelligence, Enterprise Resource Planning and Data Management.

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## 1. INTRODUCTION: THE IMPERATIVE FOR COGNITIVE TECHNOLOGY IN TAX

In recent years, modern tax functions have undergoing an existential crisis through the targeting of a complexity crisis. Such crises are created through the coalescence of powerful, interrelated drivers, rendering traditional and manual periodic compliance processes, which are dangerously obsolete. Firstly, business globalization has an entangled corporation in an interlacing web of often conflicting jurisdictional laws, such as transfer pricing rules to the more recent abiding Global Minimum Tax Rules that relate to the Organisation for Economic Co-operation and Development (OECD) Pillar Two. The digital economy has paved way for novel business models, characterized by value creation via data, platforms and immaterial assets, which the existing tax frameworks find difficult to classify and tax correctly, which lead to constant amendments in legislation and treaties (Mpofu, 2022).

Third, almost every tax authority across the world is on a crusade for transparency and instantaneous reporting, jumping from retrospective audit to real-time monitoring of transactions. Initiatives, used in different countries have called for a system to process real-time data checks and submission. The last factor is the immense volume of structured and unstructured financial data produced by enterprise systems, which causes deluges that cannot be comprehensively dissected for risk and opportunity analysis by human teams {Atabekov, 2023 #839;Ayodeji, 2025 #861}.

Historically, technological evolution in the profession has been somewhat stepwise. The age of spreadsheets, closely followed by that of Enterprise Resource Planning (ERP) systems, digitized and organized the financial data. The third phase which is more recent is the Robotic Process Automation provides robots that can be used to automate a repetitive and rule-based tasks like data entry and its reconciliation, resulting in enormous gains in efficiency in tax provisioning and compliance. However, the technologies work on predefined logical paths; they follow elaborately scripted instructions but do not comprehend (Kumar, Bhattacharyya and Krishnamoorthy, 2023). The present frontier and this review is cognitive artificial intelligence. It consists of a whole set of technologies, such as ML for pattern identification, prediction and natural language processing NLP for the understanding of human language, and generative artificial intelligence (GenAI) to generate content to process workflows, but also for interpretation, reasoning, and insight generation from complex data (Alabi, Ayilara and Jimoh, 2018; Bose, Dey and Bhattacharjee, 2023; Julius, 2024). The central idea of this article is that the direction of AI within tax is moving absolutely from automating the what (that is, the mundane and burdensome actions of data gathering and form population) to augmenting why and how (that is, specifically, interpretive and strategic reasoning constituting the professional judgment of experts) (Table 1).

This article critically evaluates the current status of AI applications in the tax remission lifecycle, and it differentiate between expert and new users. In addition, it evaluates the practical, ethical and other challenges associated with integrating AI into tax’s advisory function, while also proposing how AI can be incorporated into relevant research agenda (Julius, 2025b).

**Table 1: Artificial Intelligence’s Evolution in different Tax Function**

Phase of Technological Adoption	Core Technologies	Primary Tax Functions Supported	Nature of Professional Involvement
Manual and Spreadsheet Era	Spreadsheets, basic databases	Tax computation, form preparation, record keeping	High manual effort, rule-based judgment
ERP Digitization Phase	ERP systems, centralized databases	Data integration, transaction recording, reporting	Reduced manual work, procedural oversight
Automation Phase	Robotic Process Automation (RPA)	Data entry, reconciliation, tax provisioning, compliance filings	Supervision of rule-based execution
Cognitive AI for Compliance	Machine Learning, NLP, Computer Vision	Data extraction, classification, anomaly detection, continuous monitoring	Review and validation of AI outputs
AI-Augmented Interpretation and Planning	NLP, Generative AI, Predictive Analytics	Tax research, statutory interpretation, scenario modeling, planning strategies	High-level judgment, ethical oversight, strategic decision-making

## 2. THE FOUNDATIONAL LAYER: AI FOR COMPLIANCE AND DATA MANAGEMENT

The most advanced and commonly implemented use of AI in tax are formed from general compliance and data management workflow, where, AI acts as strong multipliers to tackle the problem of high data volume and speed. This is done through automation, making the process faster, more accurate, and increasing its consistency (Alade *et al.*, 2025). This foundation is an integral part of the process as it helps to gives the clean, organized and real time data needed for higher order analysis. AI incorporation often start with the uploading and extraction of data. It includes parsing unstructured text through various sources, such as supplier invoices in varying formats, legal contracts that govern transactions to different government correspondence. Such systems are capable of identifying and extracting relevant data like invoice number, date, amount, VAT numbers, GST numbers, terms of payment, thus relieving staff of manual entry of data and errors from transcription (Julius, 2025a). Continuing applications of this are increasingly more augmented with computer vision algorithms that inspect scanned documents or digital images of utility bills, mileage logs, and receipts, to classify and extract significant pieces of information for purposes of reporting of expense reporting and recovering indirect tax (Jimoh, Ajayi and Ayilara, 2014).

As soon as the data is extracted, machine learning is put into action to classify and reconcile the data (Ojo *et al.*, 2025; Olatunde *et al.*, 2025). Supervised machine learning models can be constructed from historical and human-coded transactions to get familiar with patterns associated with specific invoice descriptions, general ledger codes, vendor names

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and specific tax treatments (Ajayi, Jimoh and Ayilara, 2016). Over the years, these models become capable of coding incoming transactions either for income recording or indirect tax, providing book-to-tax differences, and suggesting preparatory journal entries for tax provision. All of this takes the process well beyond very stiff rule-based systems, which allows AI to deal with edge cases and unclear descriptions by matching them probabilistically to previously learned patterns. Similarly, the automation helps to closely monitor data from periodical, sample-based testing to continuous, population-level assurance. Equally, entire transaction data streams can be monitored in real-time through anomaly algorithms, arising from unsupervised ML. They build a baseline of normal, like a characteristic invoice amount coming from a vendor, and sometimes they could come from an average VAT amount for an authority, and then flag transactions differing from the baseline. This creates room to identify possible errors and transforms compliance into a very proactive management approach (Ayilara, Ajayi and Jimoh, 2016; Ibrahim *et al.*, 2025b).

Conversely, this foundational layer offers great clarity and compelling reason for investment in AI, direct and measurable returns derived through substantial manual labor cost reductions, appreciable reductions in human error rates, and a decrease in the closing and financial filing cycles (Olanrewaju and Ayilara, 2024). The automation of grunt work in tax data processing creates opportunities for tax departments to invest valuable human resources in detailed analytical activities, as opposed to that mundane working hour (Oginni *et al.*, 2024). However, the limitations of AI in tax interpretation and planning should be taken into account, although AI applications are advanced, they represent sophisticated forms of pattern recognition and execution of rules under artificial constraints (Olalekan, Esther and Adedamola, 2024).

They detect correlations and implement learned treatments; they lack a detailed understanding of underlying business certainty or the niceties of the principles of the tax law. They determine what the transaction likely is based on, but they cannot state why a novel transaction should be treated in a certain way due to statutory interpretation. Hence, even though this foundational layer is extensively relevant and effective, it serves as an automation that takes over professional tasks but does not substitute for professional judgment. This layer sets the future stage for more transformative interpretive frontier.

### **3. THE FRONTIER: AI FOR INTERPRETATION, RESEARCH, AND STRATEGIC PLANNING**

Moving past compliance automation, the emerging and academically disputed frontier is represented by AI applications within the cognitively taxing and non-routine domains of tax research and interpretation. These three areas are identified as the reserved domains of the seasoned professionals, depending on a solid command of technical knowledge, deep reasoning, and the use of judgment. AI is being advanced as an overlay to these concepts, as it promises to democratize knowledge and hasten the acquisition of insight. Direct application falls within the domain of legal and regulatory study.

Tax databases have traditionally used keyword searches, which are often frustrating because of the precision of the terms involved. Modern NLP procedures allow for semantic search, letting a professional employ natural language to ask questions like what deductibility requirements are needed for software development cost. The system then provides relevant context-specific excerpts from the tax law, regulations as well as case law, and rulings, irrespective of if the precise keywords does not match. The technology are capable of illuminate relationships among disparate code sections and map the evolution of interpretative legal thought over time. The introduction of AI as well as Large Language Models has exponentially increased the potential and peril of this frontier (Ogundoyin *et al.*, 2025; Ogunbadejo and Anna, 2025). Models such as GPT-4 can consume vast amounts of tax information and, upon prompting, summarize long court verdicts, comment on how a transaction is treated in different jurisdictions, make a draft of an official memorandum on the advantages and disadvantages of a given planning strategy, and translate even complicated concepts into plain explanations for targeted clients.

Equally, predictive analytics have transitioned planning from a static spreadsheet exercise to a more dynamic scenario-based exercise (Ibrahim *et al.*, 2025a). AI systems are capable of analyzing a company's profit not only in terms of the past but by incorporating external big data, which can be a reflection of geopolitical events, economic indicators and industry trends to forecast tax liabilities under hypothetical business strategies (Taoufik, Agbo and Obinna, 2021).

This approach is particularly useful for optimizing tax credits and incentives like R&D tax credits, in this regards AI can analyze data and assess activities and expenditures that account for the most benefits. Within transfer pricing, these technologies can analyze global databases to comparable different company financials data to identify the most pertinent benchmarks for inter-company transactions, a process that has until now been very manual, lengthy, and subjective. Notably,

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this frontier comes laden with very devastating and potentially disastrous risks, ranging from an existential uneasiness around the dichotomy between straightforward information retrieval and genuine comprehension. The crucial weakness for most emerging LLMs within a tax setting is the hallucination, the articulation of totally invented case holdings, legal citations and code section explanations that sound plausible.

### 4. CRITICAL CHALLENGES AND UNRESOLVED TENSIONS

The incorporation of AI in tax practice often encounter a number of challenges which if they are resolved will enhance the use of the technology to solve tax issues. The main problem in the incorporation of AI in tax practice lies in the inability to interpret complex models in areas like deep learning technology, hence treating such as opaque, with only the inputs and outputs being only visible.

what is referred to as the black box problem. Various unconventional ML models, such as the deep learning networks have a tendency to function in a manner, which is not very interpretable to humans. They spot intricate multi-dimensional correlations governing data but do not do something very basic that most tax practitioners would know. This inscrutability is bordering on grave violation of the professional and regulatory requirement needed for a flawless audit trail. Tax practice rests upon the ability to explain to the client a position, that would be defended before the revenue authority, while also laying documentation of its reasoning based on the law in the jurisdiction and facts available.

Dimension	Opportunities Enabled by AI	Associated Risks and Challenges
Compliance and Efficiency	Reduced manual workload, faster filing cycles, lower error rates	Over-reliance on automated outputs
Tax Interpretation and Research	Semantic search, rapid synthesis of laws and case rulings, democratization of expertise	Hallucination of legal authorities and incorrect interpretations
Strategic Tax Planning	Scenario-based forecasting, optimization of credits and incentives, transfer pricing benchmarking	Misleading predictions due to biased or incomplete data
Transparency and Explainability	Potential for Explainable AI and audit trails	Black-box models undermining accountability
Ethics and Bias	Standardization of processes and decision support	Algorithmic bias, reinforcement of aggressive tax behaviors
Professional Liability	Enhanced decision support for advisors	Unclear allocation of liability among professionals, firms, and AI developers
Regulatory Alignment	Possibility of algorithmic auditing and real-time oversight	Regulatory and standards lag behind AI evolution

The other set of problems pertains to algorithmic bias and ethics of data. No AI model is objective; they reflect the data on which they learn. If the AI for predicting audit risk is trained using historical data, it may promote historical biases: targeting certain company sizes or sectors disproportionately. A similar situation arising from a planning tool that learns from the historical aggressive tax policies of firms may result in the recommendation of a similar aggressive approach, thereby incorporating cultural bias to the process. Therefore, fairness assurance and bias reduction can only be possible through careful training data curation, ongoing monitoring of discriminatory results, and a strong ethical framework for the AI's development in tax, which as of now is in its infancy. Liability issues are perhaps any truly pressing concern to practitioners and companies. For instance, it is unclear who will be liable by law and under a code of conduct if AI-assisted analysis leads to a tax being set at an amount that is proportionately lower, or a penalty, or if there is unsuccessful litigation. It could be difficult to determine among the different stakeholders such as the accounting firm that used the tool, the software developer that created the tool that appears flawed and the experts who used the tool and did not display deepened skepticism. Legal theories based on professional negligence, vicarious liability as well as many software warranties cannot cope with this diffuse liability.

Lastly, there are systemic challenges posed by regulatory as well as standards lags. Ethical factors, regulations guiding taxes, and the normal standards in accounting have evolved within very deliberate and slow frameworks. At the other end of the spectrum, AI systems, most especially, the ones that are faced with continuous learning, change their environment

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regularly and can modify their behavior dynamically. This makes it difficult to understand if AI's recommendation be said to be in line with laws, if its reasoning is not logically covered in the existing laws in a jurisdiction. Similarly, it is also difficult to understand how professional standards of care and due competence apply when considering how an output from an AI is reviewed. Not just in terms of output, but revenue authorities will also need to learn to audit relevant algorithms.

**5. THE HUMAN ELEMENT: REDEFINING THE TAX PROFESSIONAL**

It is important to note that tax professionals will not become redundant due to the emergence of AI, on the contrary, the technology will enhance their role by helping them acquire the skills needed to become more valuable. AI would help tax experts advance from the conventional act of manual data collection and retrieval which can now both be performed by AI, the future competency of a tax expert will include the augmentation of their previously acquired skills. Notable examples of such skills include the management and oversight of models, where they will become more grounded in evaluating, selecting, and tracking the performance of the AI tool; establishing its limitations; and applying it in settings that are proper.

Moreover, prompt engineering will also be an emerging skill for articulating questions and instructions given to the AI system through which the appropriate response will be generated for a specific tax problem. In addition, professionals will require need improved capabilities in their data storytelling technique and communication to enable them translate complicated AI outputs into clear and detailed insights for businesses and other stakeholders.

Most importantly, the human professional's role will elevate to become the definitive ethical arbiter and strategic architect, applying experience, commercial context, and moral reasoning to the options generated by AI. On the long run, the prime factor that would elevating the human professional roles will be the offering of guidance, by serving as a check to ensure moral ethic, due experience, strategic architect, commercial context as well as ethical reasoning in the options created by AI. This reveals that it has become important to develop a model of new professional judgment that can best be understood as a synergistic partner, where AI becomes the supercharged and hyper-efficient research companion and analyst. In this light, Ai will be used to draft initial memoranda, roam the world to identify possible planning opportunity cases, simulate numerous tax scenarios within minutes, and constantly review transactions for potential risks.

Human professionals on the other hand will also be the final decision-maker in AI produced data. Equally, they wield many qualities that are lacking in AI, these include navigation through gray ethical spaces, emotional intelligence when dealing with clients, comprehensive business understanding and ensuring accountable and transparent judgment.

Tax professional's role in the face of AI are also important in expressing analytical power and cognitive each, rather than to compete with it. Such a new paradigm calls for transformational organizational management and cultural changes in tax firms. Critical reframing of AI's role or perception from threat or efficiency tool-only to critical collaboration should be undertaken. Training programs should be put in place for developing newly augmented skills, while quality control processes should now validate and interpret the AI-generated outputs. Adaptively, ensuring that the human tax department of the future integrates seamlessly into its machine counterparts, with both teams willing to assume their respective comparative advantages.

**6. CONCLUSION**

Summarizing all of these various points, the AI domain in taxation exhibits a peculiar gradient of maturity. Compliance and data management applications are quite mature, giving demonstrable value and steadily being regarded as typical operational technologies. Conversely, the applications for data interpretation, professional judgment enhancement and strategic planning are new, with great potential but equally grave risk, with literature being largely speculative as opposed to empirically supported. Following a concerted, interdisciplinary research agenda, catering to these domains is now an urgent necessity for the cautious navigation of this frontier, thereby enabling access to its benefits and mitigation of its hazards through parallel tracks. It is therefore very important to carry out studies to understand the human factors at play in the adoption of AI in tax issues. This will help to understand how, and under what circumstances human cognitive trust is built by tax professionals with differing experiences in the output of AI. It will also help to explain the factors that controls operational human-AI partnership on tax matters. Research should also be carried out to show the necessary changes to promote the structures of firms as well as their incentive methods, and professional principles to foster an augmented intelligence mindset.

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First, behavior and organizational studies need to be initiated in order to investigate human factors in adoption. Within the spectrum of their experience, do tax professionals decide to build cognitive trust in AI outputs or consciously disregard the output? What type of engagement clarifies human-AI collaboration, at whichever decision-making level? What about adjustments in firm structure, incentives and professional culture to nurture an augmentation mindset?

Also, research efforts should be intensified on applied computer and technology, where tax practitioners are actively involved in developing next-generation tools with a definite focus on the challenges that bothers around tax. Accordingly, all domain-specific LLMs must be actualized from scratch, exclusively trained on verified, authentic high-quality tax corpus with checks to avoid hallucination. Other key deliverables would entail advancing Explainable AI to render logically articulated stepwise rationales to simulate legal reasoning alongside lucid citation. Furthermore, scholarships should be provided to train upcoming tax experts on the ethics and legal platforms of taxes. This should enhance the development of practical liability frameworks fairly distributing risk between the AI developers, vendors and users.

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