Navigating the AI Revolution: Key Updates for Today's CPA

CPA CHARTERED PROFESSIONAL ACCOUNTANTS CANADA

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ABOUT THIS SERIES

In collaboration with the American Institute of CPAs (AICPA), CPA Canada has issued this publication as part of a series of resources for CPAs on artificial intelligence (AI) in the age of generative AI. This is the first installment of this series, with further publications to follow exploring 'closing the AI trust gap': the role of professional accountants in AI governance and risk management, and the role of AI assurance.

Read more about this series and other AI resources.

WHO SHOULD READ THIS?

- **CPAs across sectors:** CPAs working in business, public practice, government and other domains should read this paper. It provides insights relevant to their roles and helps them anticipate future needs.
- **business leaders:** Executives, managers and decision-makers in organizations are encouraged to engage with this paper to gain insights into the transformative effects of AI on accounting, finance and business operations. By engaging with this resource, leaders can better understand the strategic implications of AI adoption, identify opportunities for innovation and make informed decisions to drive organizational growth and success in the rapidly evolving digital landscape.
- **audit professionals:** Auditors and assurance practitioners will find valuable information on how AI-enabled audits are evolving and the changing role of auditors.
- **technology enthusiasts:** Individuals interested in the evolution of AI and its applications in accounting and finance will benefit from this paper.
- **forward-thinking CPAs:** those who want to stay ahead of the curve, embrace technological disruption and contribute to the profession's growth.

This paper aims to empower all CPAs, regardless of their background or specialization, to effectively navigate the AI landscape.

For more detailed insights, explore our other AI resources in this series such as A CPA's Introduction to AI: From Algorithms to Deep Learning and The Data-Driven Audit: How Automation and AI are Changing the Audit and the Role of the Auditor. These publications provide foundational knowledge and practical guidance for CPAs on AI-related topics.

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Foreword

CPAs have long grappled with feelings of unease about emerging technologies – from Lotus 1-2-3 to Excel – and their potential to render our roles obsolete. Today, similar discussions are unfolding around the use of **artificial intelligence (AI)**.

AI and automation hold the promise of transformative applications – streamlined processes, enhanced efficiency, and customized solutions – that could revolutionize the world of accounting. At the same time, **generative AI** raises critical questions about ethics, integrity and safety, necessitating careful analysis of its use and impacts on the CPA profession.

It is important to recognize, however, that disruption does not mean we should fear change. Like previous accounting technologies, AI is not here to replace CPAs; it is here to empower us.

In fact, in a recent CPA Canada Business Monitor survey,[1] 45 per cent of CPAs in leadership positions said they believe AI will free up employees from routine tasks to focus on more productive work and 36 per cent said they believe AI will help accomplish tasks not previously possible.

Picture seamless access to synthesized information, lightning-fast data processing, and precise business analysis – as routine tasks become automated, CPAs will have greater freedom to apply our expertise and professional acumen in new and increasingly strategic ways. AI also presents an opportunity to reinforce our uniquely human skills – those intangible qualities that machines cannot replicate.

With a history of serving the public interest, CPAs are uniquely positioned to instill trust throughout this period of innovation and digital transformation. Sound governance, risk management, controls and assurance are just some of the tools that CPAs can employ to help foster transparency and build confidence in both the technology and outcomes produced by AI systems.

In this joint series between the Chartered Professional Accountants of Canada (CPA Canada) and the American Institute of CPAs (AICPA), we explore the impact of AI on the CPA profession, both in the near- and long-term. CPA Canada and the AICPA combined represent more than 635,000 CPAs in business, public practice and the public sector. As two of

1 CPA Canada Q4 2023 Business Monitor Survey

the largest national professional accounting organizations, we provide relevant and timely research and thought leadership on emerging and evolving areas, such as AI, for the benefit of our members and the broader business community.

As we continue to navigate the AI ecosystem, let's embrace this technological evolution as an opportunity to adapt and grow, harnessing its capabilities to amplify our profession's influence while upholding the ethical principles that define our practice.

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Introduction

Artificial intelligence (AI) has experienced significant growth and advancement in recent years, transforming various industries and sectors, including professional accounting. This paper aims to provide Chartered Professional Accountants and Certified Public Accountants (collectively, CPAs) with an overview of the evolution of AI and the pace of change in AI capabilities since the publication of the foundational resource, "A CPA's Introduction to AI: From Algorithms to Deep Learning." This is the first paper of a three-part series, with two subsequent papers addressing the opportunities for CPAs in industry and public practice to guide the implementation of robust AI governance and control practices to ensure AI systems are safe and reliable.

Despite louder calls for regulations and government oversight for AI development and use, regulators and standard setters are challenged with keeping pace with advancements in AI capabilities. For example, after years of public consultation and intense multi-jurisdictional consensus building, the European Union Artificial Intelligence Act (EU AI Act) underwent a significant rewrite to incorporate generative AI, a new class of AI capabilities that gained popularity in November 2022 with the public launch of ChatGPT. The reason for the rewrite was that the EU AI Act was written for single-use, traditional AI models prevalent in 2021. ChatGPT is one of many general-purpose AI systems (GPAIS) changing the landscape of AI use in corporations. GPAIS are foundation models capable of completing a wide variety of tasks which exponentially increases the breadth of use cases they can support and their related risk profiles.

Similarly, Canada and the United States have undertaken initiatives to provide guardrails for the responsible development and deployment of AI systems. Canada's Artificial Intelligence and Data Act (AIDA), first tabled in June 2022 by the Government of Canada as part of Bill C-27, the Digital Charter Implementation Act, is Canada's regulatory response in this area. Leading guidance in the United States includes The Blueprint for AI Bill of Rights, introduced in October 2022 to provide principles and practices to design, use and deploy AI systems to protect the rights of the public, and the National Institute of Standards and Technology (NIST) Risk Management Framework (RMF). In October 2023, President Biden reinforced the key role of NIST as a guideline for managing the risks of AI in his Executive Order on the Safe, Secure and Trustworthy Development and Use of Artificial Intelligence. Both AIDA and the NIST RMF are undergoing public consultations and reviews to respond to the new risks raised by generative AI and GPAIS and to strengthen AI safeguards. This is an opportunity for CPAs, both Canadian and American, to take a leading role in developing robust risk and control frameworks for this emerging technology.

Building upon their expertise in evaluating the quality of data and controls, CPAs are in a unique position to provide valuable insight into the development of AI regulations and guidelines and to assist their organizations in designing and implementing robust controls over data feeding into AI systems, along with the AI systems themselves. Moreover, with the advent of generative AI, ground-breaking use-cases are on the horizon for CPAs to revolutionize both financial and operational reporting and analysis. By embracing the AI transformational opportunity, CPAs can harness AI capabilities to maximize the efficiency and depth of their accounting practice. They can also become the trusted guardians of these transformative technologies, cultivating assurance in AI inputs and outputs within both external public practices and internal corporate governance structures.

Evolution and pace of change in AI

Over the past couple of years, the landscape of AI has been dramatically reshaped by a series of remarkable innovations. These advancements have not only pushed the boundaries of technology but have redefined the interaction of AI within various sectors, including accounting.

One such innovation is generative AI. Generative AI has stretched beyond the capabilities of conventional AI, moving from analyzing data to creating entirely new content. The progression to foundation models further enhances this creative capability, with AI systems being trained on a broad swath of data, learning to predict and generate outputs in numerous contexts, a characteristic especially beneficial for CPAs dealing with diverse financial scenarios.

Multimodal AI adds another layer of sophistication, as these models deal with not just one but multiple formats of data, whether it is text, images or numbers. This can equip CPAs with a more comprehensive view, analyzing multiple data types for a more exhaustive audit or analysis.

Finally, AI's integration with existing technologies is manifesting into **embedded AI**, where AI models are directly incorporated into rules-based enterprise resource planning (ERP) systems. This not only makes AI more accessible to users but also enhances processing capabilities, increasing efficiency and decision-making quality in accounting.

In the following sections, we dive deeper into each of these advancements and explore their promising implications for CPAs in today's digital age. But before we do, it is helpful to understand how the different types of AI are related to each other. In the below illustration we demonstrate how generative AI is in fact a type of machine learning, deep learning and foundation model.

Artificial Intelligence

AI, or artificial intelligence, is a field of computer science that focuses on creating intelligent machines capable of tasks requiring human intelligence.

Machine Learning

Machine learning is a subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behaviour.

Deep Learning

Deep learning is a subset of machine learning, which is essentially a neural network with three or more layers.

Foundation Models

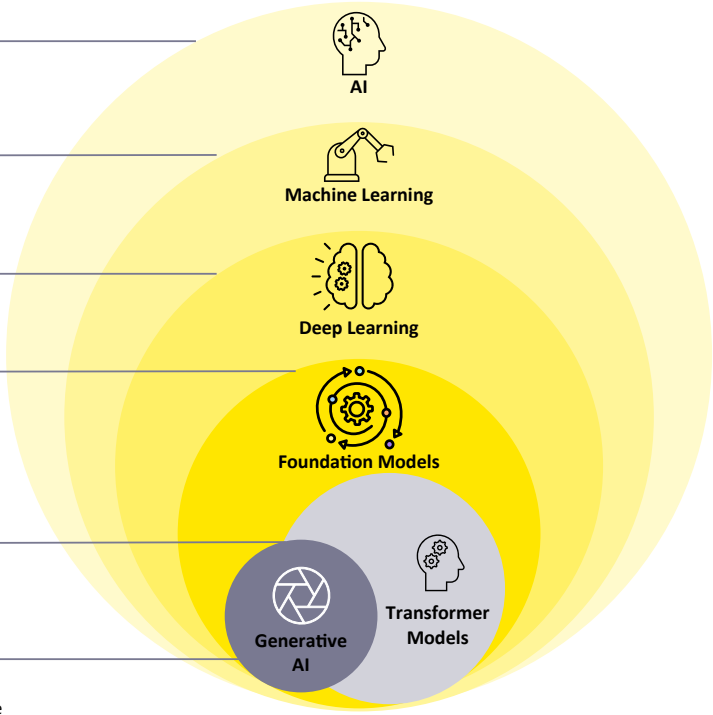
Foundation models are those that serve as the basis or inspiration for further research and development in a particular field. In the context of deep learning and natural language processing (NLP), foundation models refer to pioneering architectures or approaches that have laid the groundwork for subsequent advancements.

Transformer Models

Transformer models are a type of deep learning architecture that has revolutionized natural language processing (NLP) and other sequential data tasks.

Generative AI

Generative AI is a type of artificial intelligence that can create new content such as images, text, audio, or video based on the data it has been trained on, using techniques like large language models, transformer neural networks, and generative adversarial networks.



Source: EY

Generative AI

Since its initial introduction in research labs, generative AI has rapidly evolved and witnessed an unprecedented rate of adoption. This swift progression has significantly increased the expansion of AI use cases, causing a revolution in its application across varied sectors and roles. For example, within two months of its release in November 2022, ChatGPT had achieved the fastest adoption of any prior technology hitting 100 million active users, a feat that took Facebook 4.5 years to achieve. A year after its introduction, 92 per cent of Fortune 500 companies are using ChatGPT[2] and thousands of generative AI applications have been introduced.

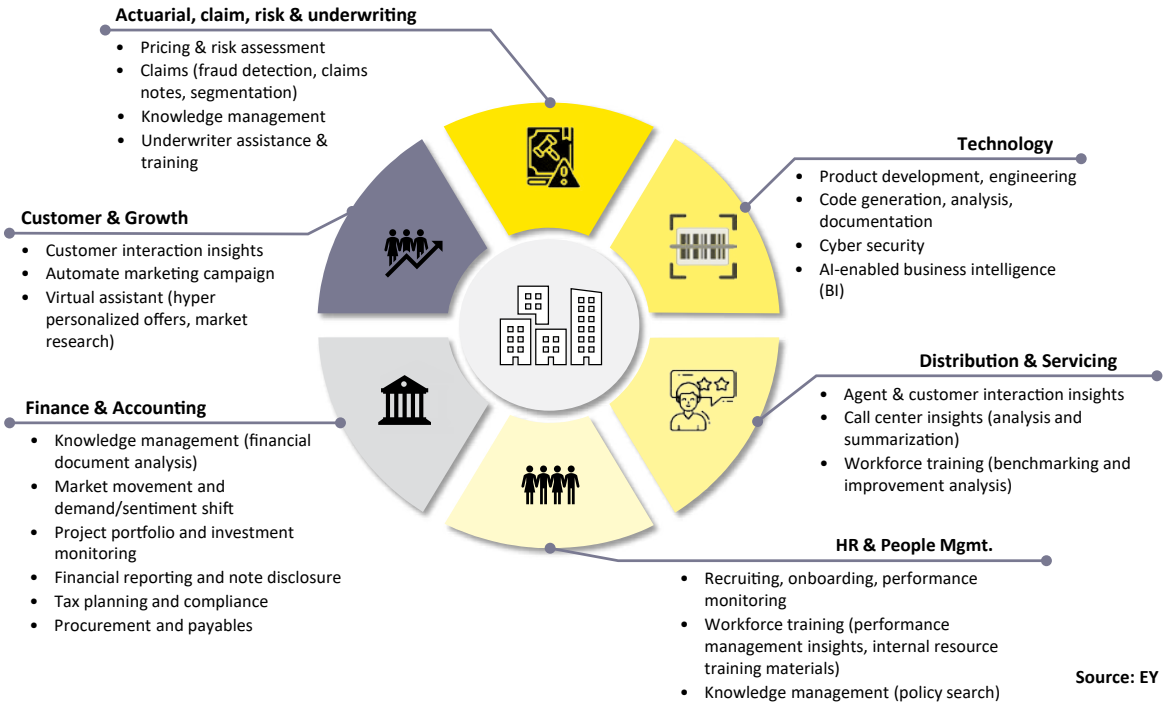
Generative AI represents a significant leap forward in the realm of AI. At its core, generative AI refers to the class of algorithms and models designed to generate new content based on patterns and information gleaned from existing data. Generative AI leverages complex neural networks to generate content such as text, code, images, sound or even entire datasets.

2 ChatGPT Statistics – User Demographics (January 2024). demandsage.com

Generative AI has played a key role in democratizing the use of AI by making advanced AI capabilities more accessible to a broader range of users, beyond experts and data scientists. Several factors contribute to this democratization:

1. **User-friendly interfaces**
   Generative AI platforms often come with user-friendly interfaces, and tools that are natural language enabled and do not require a deep understanding of machine-learning or programming. This empowers the individuals with domain expertise in business functions other than technology to leverage AI capabilities without having to be experts in the underlying technology.
2. **Pre-trained models**
   Many generative AI models, including ChatGPT, are pre-trained on extensive datasets. This pre-training phase imparts a general understanding of natural language queries, context and patterns to the model. Users can then fine-tune these pre-trained models for specific tasks, such as accounting-related analyses, without having to start from scratch. This reduces the barrier to entry for users who may not have the resources or expertise to train models from the ground up.
3. **AI cloud-based services**
   Cloud-based AI services enable users to deploy and run generative AI models without the burden of managing complex hardware and software setups, making AI more economically feasible for a broader audience.
4. **Open-source services**
   By leveraging a more open ecosystem, the AI community has enabled users to access pre-trained models more readily, share best practices and seek guidance from the AI community through knowledge-sharing platforms and collaborative efforts. As a result, individuals with varying levels of expertise can benefit from a wealth of resources and insights, fostering a more inclusive AI ecosystem.
5. **Domain-specific AI applications**
   Generative AI can be used for applications in a wide range of fields beyond traditional technology domains, including finance, healthcare and creative industries. This means that professionals from different backgrounds can leverage generative AI to address domain-specific challenges.

Using an insurance company as an example, the following graphic illustrates the varied type of areas where generative AI could be used, ranging from front-line operations to back-office finance functions.



Specific generative AI use cases

Generative AI has the potential to transform the finance function with its innovative capabilities, as shown by the illustrative use cases provided below. However, amidst these advancements, the importance of human oversight in quality-checking generative AI outputs remains paramount, ensuring accuracy and reliability.

Financial report generation

Generative AI can significantly streamline the process of creating detailed financial reports. It can automate the compilation and formatting of financial statements having "learned" from prior period reports, including those of peer companies.

Forecasting and predictive analysis

Distinguishing itself from traditional models, generative AI employs its sophisticated algorithms to create extensive, actionable content. This includes detailed forecasts for budgeting, comprehensively laid-out cash flow projections and intricate risk management strategy documents, all providing CPAs with superior insightful data for judicious decision-making.

Compliance and regulatory document analysis
Generative AI can be used to analyze and summarize complex regulatory documents, including recent changes and evaluations on applicability for an organization. This will significantly decrease the effort for CPAs to stay up to date with evolving compliance requirements, mitigate the risk of non-compliance and allow more time for strategic compliance planning rather than manual document analysis.

For CPAs, the rise of generative AI signifies the ability of systems to sift through historical financial records, regulatory documents and sector-specific data, translating them into precise and contextually apt financial reports, forecasts and analyses. A primary distinction from traditional AI is that generative AI not only creates fresh content but also presents it in an easily comprehensible manner rather than in complex mathematical or statistical forms. For instance, large language models can generate new written outputs with appropriate sentence structures and grammar, organizing material in paragraphs or tables. Going beyond crunching numbers, generative AI has the potential to draft an entire financial report for you, tailored to any persona you desire.

Current challenges with generative AI

Despite its obvious utility, the implementation of generative AI also presents unique challenges that need careful consideration. As noted in a recent paper from Google "even the largest language models, however, can still struggle with certain multi-step reasoning tasks, such as math word problems and commonsense reasoning."[3] The phenomenon of "hallucinations" where generative AI generates or interprets information that does not exist, can also lead to significant errors or misjudgements. Other issues may include over-reliance on generative AI without human oversight, misuse of its predictive modeling and skewed decision-making due to biases coded into the system. Given the high accuracy imperative in financial statements, it is essential to ensure rigorous quality checks of generative AI outputs to guarantee their integrity, reliability, completeness and accuracy.

Diligent attention is also called for in addressing issues related to data privacy, ethical implications, bias in algorithmic choices and the necessity for a robust cybersecurity framework for AI systems. Legal considerations pose another layer of complexity, especially pertaining to content generation, such as training AI on proprietary or licensed data, and the question of who owns the resultant outputs.

There is also a significant knowledge gap among users that needs bridging. As AI becomes increasingly accessible, there may be a lack of relevant training to correctly use and interpret the output of the generated content. This becomes especially problematic as AI can be used by anyone, regardless of their professional skepticism, potentially leading to inaccuracies or

3 https://deepmind.google/discover/blog/language-modelling-at-scale-gopher-ethical-considerations-and-retrieval/

misinterpretations. Therefore, comprehensive user education becomes a critical component in the effective and responsibly sound deployment of generative AI technology within the field of accounting.

The technology's dynamic nature requires CPAs to stay abreast of advancements, continuously adapting their skills to leverage generative AI effectively. As the accounting profession embraces the capabilities of generative AI, a balanced understanding of its potential benefits and challenges is crucial to harness its power responsibly and ethically.

Below is a list of illustrative risks and issues that could be considered when developing, training, implementing and using AI. Note that this is not an exhaustive list of all risks and issues that may need to be considered.

- completeness, accuracy and reliability of the output
- legal risks associated with generating content (e.g.: training AI on proprietary/licenced data, copyright infringement and ownership of the results)
- knowledge gap in the users due to lack of familiarity and lack of relevant training to use and interpret the results of content generated
- accessibility to all, with or without professional skepticism
- risk of AI hallucination due to biased and unrepresentative training datasets
- data protection and informed consent of data used
- biased outcomes

To gain a deeper understanding of generative AI, including use cases and implementation challenges, consider reading CPA.com's **Generative AI Toolkit**.

Foundation models

Generative AI popularized a new layered approach to AI models. Rather than each model representing a single use case, **foundation models** empower multiple use cases. Foundation models are like the foundation of a house, providing a solid base upon which developers can build diverse AI applications. Although these foundation models can be interacted with directly, in recent months developers have begun to use the foundation models as GPAIS in which they develop on top of their general capabilities, more sophisticated, domain-specific AI applications.

A **foundation model** is a large-scale, machine learning model that is trained on a broad data set so that it can be adapted and fine-tuned for a wide variety of applications and downstream tasks. Foundation models are known for their generality and adaptability to support a multitude of **domain-specific models**.

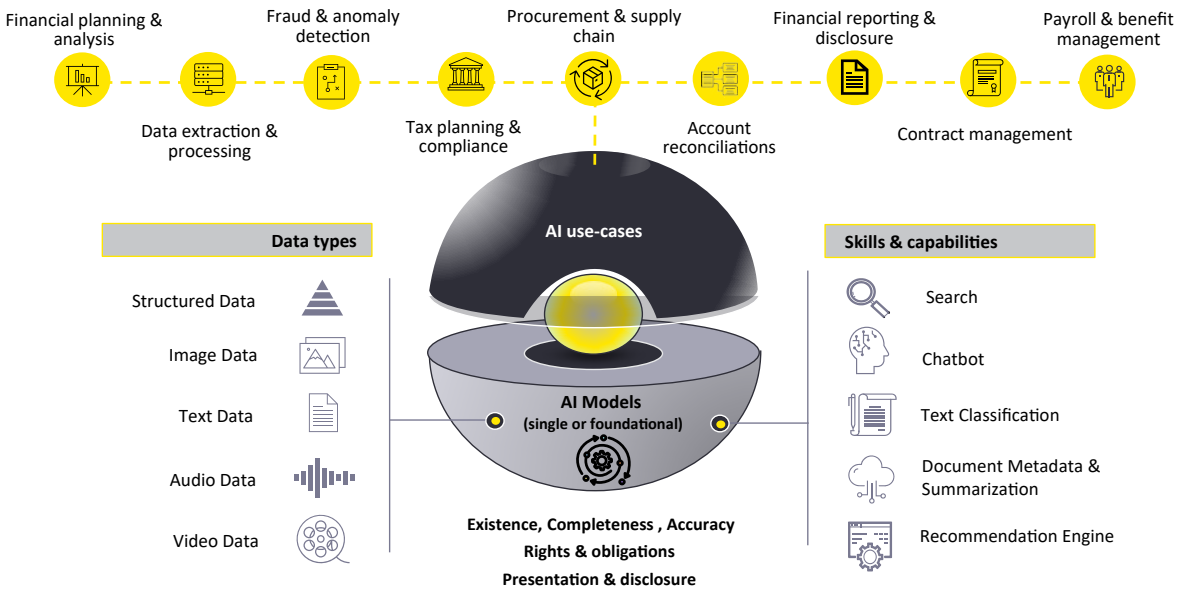
The GPAIS can perform a wide range of tasks across various domains, mirroring the versatility and adaptability of human intelligence. Such a system is capable of problem-solving and adapting contexts without being narrowly specialized in a specific task or industry. By applying AI to multiple operations horizontally, redundancies can be minimized, manual tasks automated and overall productivity enhanced. However, the "general" intelligence of these GPAIS is still limited and does not currently reach the same level of performance as a highly trained CPA. This general-purpose approach may not cater to task-specific complexities and nuances, thereby impacting the level of detail and precision in output.

Domain-specific models can be built from scratch but are more frequently being built on top of foundation models. For more domain-specific use cases, such as financial reporting, a more narrowly defined AI application is built on top of the GPAIS. This has the advantage of creating a more tailored and process-specific application, enabling deep, thorough transformations that can potentially overhaul the way the process operates end-to-end. Detailed insights and specialist capabilities can greatly enhance the quality and effectiveness of the output. However, the disadvantage here lies in the potential high development cost and resource investment required to train a domain-specific AI system.

The benefit of leveraging a GPAIS is that the training can be limited to specialized training, thereby significantly reducing the cost and time to train the domain-specific AI. The training can also specify that the AI application produce its output in the format and persona best suited for the use case. Users must beware however that the AI system was trained for a specific purpose and its performance may deteriorate significantly outside of its narrow use case.

Developers have just scratched the surface of leveraging foundation models and the domain-specific AI applications that can be built upon them. CPAs should be involved in the corporate decisions made as to what foundation capabilities are needed for their organization, the prioritization of AI use cases and the control mechanisms and safeguards to be put in place.

The illustration below outlines the layered approach of building AI use cases leveraging a single or foundation AI model, and the inter-relationship between the data, model, and AI skills and capabilities. These use cases can be trained on various types of data, taking into account essential assertions related to financial reporting and related controls. The ultimate goal is to enable the AI model to acquire the necessary skills and capabilities to perform its intended functions effectively.



Source: EY

Multimodal generative AI

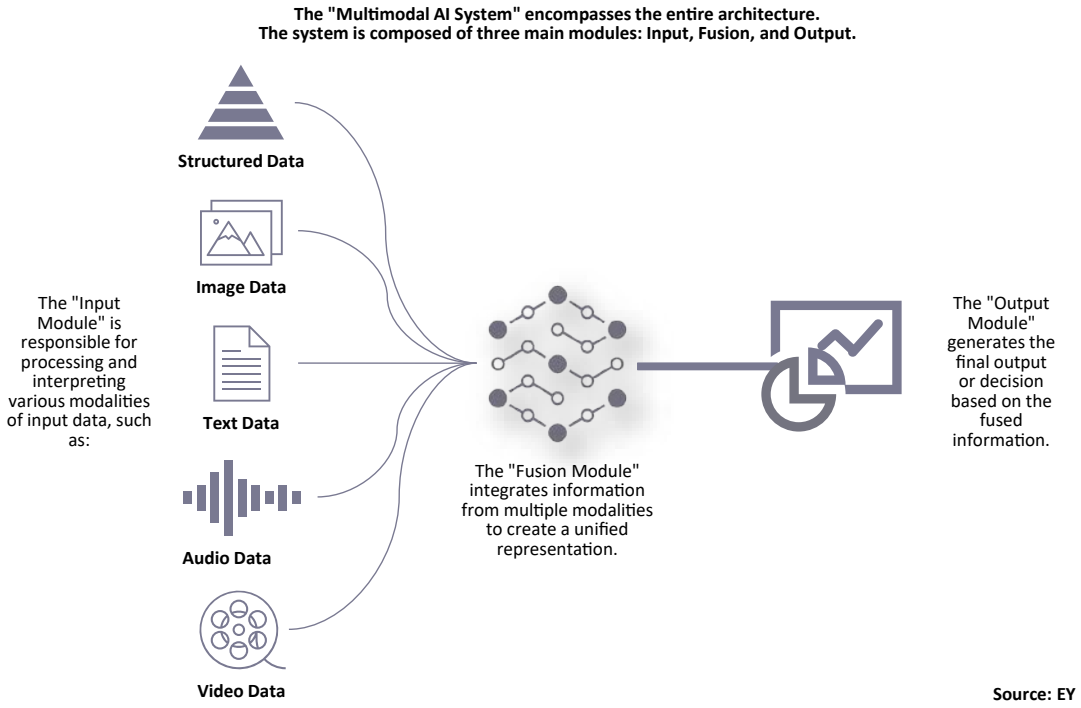
Generative AI's prowess truly unfolds when it can engage with data in various formats. Suppose a CPA is using generative AI to assess different forms of information and audit evidence provided for an audit. In this scenario, generative AI could be used to compile and scrutinize financial text records, numerical data, visual charts and even assess video testimonials. By processing these multi-format data, generative AI could generate a report with integrated insights far surpassing single-format data analysis. It is in this diverse, multi-format approach that CPAs can tap into an unprecedented wealth of comprehensive inputs and foresights, elevating their analytical capabilities to an entirely new level.

Multimodal generative AI, often used interchangeably with 'multimodal AI', combines multiple types, or modes, of data such as video, audio, speech, images, text or numerical datasets to establish content and insights unachievable through single modal AI. The fundamental difference between multimodal AI and traditional single modal AI is the data. A single modal is generally designed to work with a single source or data type and is tailored for a specific task. For example, a financial AI system uses textual and numerical data sources from inhouse business financial data to make financial projections or develop insights on financial

problems. A multimodal AI system is trained to process data from multiple sources including, for example, video and speeches from investor analysts, images from research websites and sentiment analysis from customer social sites.

Multimodal AI systems consist of three main components:

1. The **input module** is a series of neural networks, each designed to ingest and process a specific data type such as text, speech or vision.
2. The **fusion module** brings it all together by utilizing transformer models and integration systems to combine, align and process the data from each modality into a combined dataset.
3. The **output module** is responsible for creating the output from the multimodal AI in a form that the human operator can utilize.



CPAs are often working with multimodal media, and so the availability of these capabilities in generative AI greatly expands the insights that can be gained. For example, in analyzing investor reports for a potential acquisition, a multimodal AI could not only process textual descriptions and numerical tables, but also contextualize the meaning behind graphical

images and aerial photos. Call centres that already use AI to transcribe call interactions can now expand their sentiment analysis by identifying emotional cues from the speaker's tone of voice. If on video, facial expressions are another source of predicting mood.

Multimodal AI also comes with a myriad of challenges. Dealing with numerous different data sources in a multimodal AI system can pose challenges in terms of output explainability due to increased complexity and interconnectedness, heterogeneity in data types, comprehensive interpretability, data quality and end-user understanding. The multiplication of different data sources creates parallel data flows that drive increased capacity and costs needed for data storage and redundancy. Users must also consider the differences in maturity in working with different data types. AI models are far more adept in distinguishing meaning and nuances from written than spoken text, making AI better at deriving accurate meaning from text than sound or images. Lastly, the complexity of multimodal AI relying upon multiple input neural networks, and integrators in the fusion level, significantly increases areas where potential errors can occur.

Multimodal AI systems are still in their infancy; however, it is anticipated that this functionality will continue to proliferate and expand the capabilities of GPAIS. An early use of multimodal AI has been the ability for prompts to be spoken and transcribed by the **generative pre-trained transformer (GPT)**, rather than typed. Similar functionality is at the heart of image generators in which prompts, written or spoken, alongside the upload of image-based inputs, are combined to create a new image. **Deepfakes** are another example of multimodal applications in which speech or video content of the intended target is combined with textual instructions of the "new" (but usually fraudulent) speech to be generated.

As the use of multimodal AI systems expands, it is crucial for CPAs to keep a close eye on its proliferation. This rapid expansion calls for a reassessment of existing AI governance and control programs to address the complexity of multimodal systems and its multiple failure points.

Embedded AI

Embedded AI is revolutionizing the way organizations leverage technology by seamlessly integrating AI capabilities into existing software and business applications. This transformative approach brings intelligence directly into the tools and platforms that employees, including CPAs, use daily, enhancing productivity, automating tasks and providing valuable insights.

Traditional software providers such as Oracle, SAP, ServiceNow and Microsoft are incorporating embedded AI capabilities into their suite of applications. They are introducing **AI copilots**, which serve as intelligent companions embedded within productivity applications. These copilots harness the power of AI to understand user behaviours, preferences and work

patterns. By proactively offering suggestions, automating repetitive tasks and providing context-aware assistance, copilots empower users to work more efficiently and focus on higher-value activities. This seamless integration enables organizations to derive actionable insights, enhance operational efficiency and stay agile in an ever-evolving business landscape. These capabilities span various modules, from finance and supply chain to software coding.

AI copilots are a type of virtual AI assistant designed to mimic the feeling of interacting with a human assistant. These AI systems are designed to collaborate with humans in a cooperative and symbiotic manner to provide real-time support, guidance and insights.

Copilots, with their user-friendly interfaces, allow for AI use across an array of business technologies, making AI applications accessible and uncomplicated even for those without coding knowledge. This seamless integration, however, is also risky as users might not always realize they are utilizing AI, masking the sophisticated technology running in the background. It is essential to cultivate an awareness of the intrinsic responsibilities that come with AI usage, ensuring vigilant measures are in place to mitigate potential risks such as algorithmic biases, inaccuracies and other related vulnerabilities.

By incorporating AI into these existing technologies, software as a service (SaaS) providers are leveraging the vast amount of data already available to them. Early corporate productivity software pilots have demonstrated efficiency gains in leveraging meeting transcripts to schedule follow-up meetings, preparing document request emails and developing next action lists. New multimodal applications are being built to draw upon multiple data sources to generate complex documents including proposals, contracts and financial reports. ERP systems are using AI and readily accessible data to create early indicators of potential fraud or control failures. And software code generators are revolutionizing software development by providing efficient and context-aware code suggestions.

Although it will take time for these embedded AI technologies to become mainstream across all corporate jobs due to organizational policies and strategies, the use cases and adoption rates are showing early explosive growth. CPAs should be early adopters of these technologies not only to take advantage of their productivity and quality gains, but so that they can better understand how the AI technology works and its potential to fail. This knowledge will be extremely important as CPAs are looked to by their organizations to ensure that governance and control practices over AI keep pace with the copilot technology.

Governing and controlling AI

Ethical considerations and guidelines for responsible AI practices have become more prominent in recent years. As AI technology becomes more pervasive, there is a growing recognition of the need for trust and transparency in AI systems. Organizations are adopting responsible AI practices to ensure fairness, accountability and transparency in their use of AI algorithms. Furthermore, the ability to collect and analyze data from interconnected devices has led to significant advancements in various industries.

As organizations increasingly incorporate AI into their operations, the importance of establishing robust governance and control mechanisms becomes paramount. The multifaceted nature of AI, coupled with its potential to impact decision-making processes, data security and ethical considerations, underscores the need for a strategic and comprehensive approach to its development and deployment. In this dynamic landscape, CPAs emerge as crucial stakeholders, equipped with the financial acumen, risk understanding and ethical sensibilities needed to navigate the complexities of AI governance.

In the next paper in this series, we provide a deeper dive into the governance and control implications of AI and the important role that CPAs will play into developing AI governance frameworks that not only meet compliance requirements but also foster trust among stakeholders.

A Futurist's Perspective on AI

About the Futurist: Pascal Finette

Pascal is the co-founder of be radical, EY's wavespace Advisory Board chair, and jury chair for Science and Innovation Management at Falling Walls Foundation. Previously he held leadership positions at Google.org, Mozilla and eBay, built technology startups and launched a Venture Capital firm. He is the posse leader at TheHeretic.org, and the cofounder of the Women's Impact Alliance.

In the ever-evolving landscape of professional accounting, the integration of AI into nearly all standard processes stands poised to redefine traditional practices and usher in a new era of efficiency and innovation. While the promise of AI enhancing routine tasks such as data entry, compliance checks and even complex financial analyses is well acknowledged, it is the burgeoning capabilities of AI in the realms of data manipulation and autonomous decision-making that herald a seismic shift in accounting.

Small, local and affordable

The emergence of small yet powerful foundation models that can run on standard laptops highlights a future in which AI is both widely available and cost-effective. This shift in cost dynamics has significant implications for the adoption of AI in accounting practices. The democratization of AI technology not only expands access but also enables firms to deploy AI in more innovative and strategic ways. They can utilize locally trained models on internal data to safeguard data privacy and customize insights according to their specific organizational requirements.

Connected and autonomous

Moreover, the future beckons with the promise of AI systems that can engage in more nuanced and complex tasks through the integration of application programming interfaces (APIs), moving beyond mere analysis to actively engage with and manipulate external data systems autonomously. This evolution towards autonomous bots, capable of executing transactions or making decisions based on real-time data analysis, could revolutionize accounting practices, making them more responsive and adaptable to changing market conditions.

Multimodal and combinatorial

With advancements in AI's ability to interpret and analyze multimodal data inputs, such as converting photos or scans of financial documents into actionable data, and the development of combinatorial models that integrate different AI approaches under

one hood, the potential of AI in accounting goes far beyond automation. It paints a future where CPAs have tools to enhance operational efficiency and expand their role as strategic advisors. These tools leverage deep, data-driven insights to guide business decisions, combining, for example, generative AI, to understand user questions, with traditional machine learning algorithms, to deliver precise and accurate results while eliminating today's still common mistakes and hallucinations.

The road ahead cannot just be about adapting to these changes; it is about actively shaping them to redefine the essence of accounting in the AI era.

Conclusion

The rapid evolution of AI presents numerous opportunities and challenges for the professional accounting field. This paper has highlighted the significant changes and showcased the importance of governance and control practices keeping pace with advances in AI functionality and use. The future of AI in accounting holds great potential for further advancement and disruption.

AI-powered technologies have already made significant strides in automating repetitive tasks, detecting fraud, improving financial forecasting, enhancing audit processes and streamlining tax planning. As AI continues to evolve, its integration with technologies such as ERP systems, blockchain, real-time analytics and virtual copilot assistants will further transform the accounting profession.

However, it is important to carefully navigate the ethical and regulatory implications of AI in accounting. Responsible AI practices will be essential to ensure fairness, transparency and accountability. CPAs should work with multiple stakeholders including their technology partners and external regulatory bodies and professional organizations to establish guidelines and standards to govern the use of AI technologies.

The next paper in this series will further examine the potential risks and impacts of AI, and leading governance and control practices. It will also examine the role of guidelines, standards and regulations in establishing internally recognized frameworks for establishing a robust responsible AI program. The third paper in the series will discuss the growing call for building trust in AI systems and the important role that assurance will play in the AI ecosystem.

As you digest the information provided in this paper, here are three actions that you can take right now:

1. Research and understand your organization's specific AI use and ongoing AI journey.
2. Actively participate in ongoing training, workshops and AI governance panel discussions.
3. Conduct a maturity assessment of your organization's responsible AI governance, risk and control framework.

Appendix: Glossary of terminology

Artificial intelligence (AI): The Organisation for Economic Co-operation and Development (OECD) defines an artificial intelligence (AI) system as a machine-based system that can, for a given set of human defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. When applied, AI has seven different use cases, also known as patterns, that can coexist in parallel within the same AI system.

AI copilot(s): Intelligent systems or algorithms that work alongside human operators to assist and enhance their decision-making and performance in various tasks. These AI systems are designed to collaborate with humans in a cooperative and symbiotic manner, leveraging machine learning, natural language processing and other AI techniques to provide real-time support, guidance and insights.

Deepfake: Refers to the use of artificial intelligence (AI) techniques, particularly deep learning algorithms, to create or manipulate audio, video or images in a way that appears convincingly realistic but is actually fabricated or synthesized. These techniques employ generative adversarial networks (GANs), autoencoders and other deep learning models to superimpose or replace the appearance or voice of one person onto another, resulting in manipulated media that can be difficult to distinguish from genuine content.

Domain-specific model: A domain-specific model is tailored and optimized for a particular domain, task or application. Unlike foundation models, which are more general, domain-specific models are designed to excel in a specific context.

Embedded AI: Embedded AI refers to the integration of artificial intelligence (AI) capabilities into various devices, systems or applications at the edge of a network, close to the data source. Unlike centralized AI systems that rely on cloud computing, embedded AI processes and analyzes data locally on the device or within the system where the data is generated.

Foundation model: A foundation model, in the context of artificial intelligence, typically refers to a large, pre-trained model that serves as a fundamental building block for various downstream applications and tasks. These models are often trained on vast amounts of data and have a broad understanding of natural language, images or other types of data.

Generative AI: Generative AI refers to a class of artificial intelligence models and algorithms that are designed to generate new content, often in the form of images, text or other data types. These models are trained on large datasets and learn patterns, structures and styles from the input data. Once trained, they can generate new content that shares similarities with the training data.

Generative pre-trained transformer (GPT): An artificial intelligence model pre-trained on extensive datasets, enabling it to generate human-like content across various modalities, including text, images and audio. This large-scale model utilizes a Transformer architecture to understand and process context within the data, facilitating the production of coherent and contextually relevant outputs in the respective domains.

GPAIS: General Purpose Artificial Intelligence System, or GPAIS, refers to an AI system which is based on a general-purpose AI model that has the capability to serve a variety of purposes, both for direct use as well as for integration in other AI systems. These systems are designed to perform a wide range of tasks and functions, such as image recognition, speech synthesis, question answering, translation, and more. They are versatile and can be integrated into various contexts and other AI systems. Generally, GPAIS refers to AI systems that have broad applicability and can handle diverse tasks.

Multimodal generative AI (multimodal AI): Multimodal AI refers to artificial intelligence systems or models that can effectively process and understand information from multiple modalities, which are different types of data sources.

Neural network: A computational model inspired by the human brain. It consists of interconnected nodes (neurons) organized in layers. These networks learn from labeled data, adjusting weights to minimize prediction errors. Deep neural networks, with many intermediate layers, have revolutionized fields like computer vision and natural language processing.

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