Artificial Intelligence in Accounting

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Executive Summary

This report will introduce Artificial Intelligence as a whole and focus on how AI is changing Accounting. This report will focus intensively on OpenAI's API (Application Programming Interface - essentially any software with a distinct function) ChatGPT. This report also discusses security and ethical issues surrounding ChatGPT and other AI platforms.

According to a recent study by OpenAI, occupations like accountants and tax preparers have 100% exposure to AI. Other jobs include mathematicians, writers, journalists and climate change policy analysts (Lazanis, 2023). This report will outline how AI is being used in accounting, provide examples of how AI is being integrated into accounting software such as Xero and how accountants can get the most out of ChatGPT.

Lastly, this report will evaluate how AI will affect accounting in the short term.

Introduction to Artificial Intelligence (AI) and ChatGPT

Artificial intelligence is the science of making machines that can think like humans. It can do things that are considered "smart." However, unlike humans, AI technology can process large amounts of data in different ways that would traditionally take days, if not weeks. The goal for AI is to be able to do things such as recognise patterns, make decisions, and judge like humans. In short, AI enables technical systems to perceive their environment, deal with what they perceive, solve problems and act to achieve a specific goal.

"In accounting, AI refers to using artificial intelligence (AI) technologies, such as machine learning algorithms and natural language processing, to automate and enhance various accounting processes. This includes financial reporting, audit and compliance, fraud detection, and data analysis. AI in accounting can help improve accuracy and efficiency, reduce costs, and provide valuable insights and predictions for decision-making." - This definition was generated using ChatGPT 3.5 (September 2023).

ChatGPT is an advanced AI program designed for natural conversational interactions. ChatGPT is part of OpenAI's language model lineage, which began with GPT (Generative Pre-trained Transformer) models. OpenAI released GPT-3 in 2020, which demonstrated remarkable language generation capabilities. ChatGPT's direct competitors include Google's Bard AI, Microsoft's Bing AI and Perplexity AI. OpenAI continually refines and enhances these models through iterative training and data collection, improving their utility and safety while ensuring responsible AI use.

Hundreds of AI APIs are on the market, each with benefits and drawbacks. For example, Perplexity AI boasts the ability to "Copilot" and browse the internet, a feature ChatGPT cannot do without GPT 4.0. However, it lacks a comprehensive language model, diminishing its ability to strike human-like conversations.

In short, ChatGPT generates output using tokens and workpieces, calculating the **likelihood of words appearing together** It uses a generative pre-trained transformer, employing deep learning to generate humanlike text.

These AI models are consistently improving and being “trained”. GPT 4.0, marketed as the “new and improved” version, is an example of a developing AI model, building on and improving from GPT 3.5. While there isn’t any specific public information on how this model is better, initial user experiments concluded that GPT 4.0:

- Provides better reasoning and less “hallucination” in answers
    - Hallucination in the sense that GPT 3.5 had a high likelihood of making up answers and providing false information since it didn’t have the sense to analyse the accuracy of what is provided online
- Works slower than GPT 3.5 but provides more in-depth and accurate answers for *objective* questions
- Has a higher guardrail in terms of thinking outside of the box

Users have already deciphered that GPT 4.0, with its higher guardrails in attempts to hallucinate less, is worse in “creative situations” or when placed in a scenario. For example, if ChatGPT 4.0 were asked to write an imaginative fiction extract, the output would sound robotic and not written by a human. This reveals that not all changes are improvements, and it is important to know what AI API is the most useful in each specific scenario.

Security and Privacy Surrounding the Use of AI

The technological evolution of AI has also brought forth a host of ethical dilemmas and concerns. Ethical issues such as transparency, bias, and accountability are complex and multifaceted, touching on aspects of data privacy, human-AI interactions, fairness, and the broader societal impact of these technologies. While all APIs have different terms and conditions, most are similar to OpenAI's data policy, which governs how it uses the data submitted to its API services, including ChatGPT. While these guidelines are somewhat vague, they can be summarised into the following:

- OpenAI will not use data submitted by customers via its API to train or improve its models unless they explicitly opt-in to share their data via the settings
    - Please note that the upload of data can be turned off in the settings. By turning off "Chat History & Training", OpenAI will no longer use any data inputted into ChatGPT to train the model. However, all users opt-in to share data by default
    - If you regularly process sensitive data, consider checking this setting to prevent accidental slip-ups.
- This data used for model training is anonymised and stripped of personally identifiable information. However, it seems that confidential, personal information will still pass at least one set of human eyes.

From this, we can assume that all inputs written into ChatGPT are remembered. However, it has been confirmed that this data is not used in real time. This data is collected by human OpenAI trainers and analysed to remove harmful and damaging information. However, it is up to human discretion if the information is classified as "harmful".

Within accounting, sensitive information could range from:

- Client's BSB and Account numbers
- Tax client's TFN
- Company ABNs
- Personal address or phone number
- Confidential company earnings/important figures
- Credit/Debit card details
- Passwords/PIN

AI in Accounting

There are two main applications of AI in accounting. They include:

- Applying AI to unstructured data problems to speed up manual work
- Utilising AI to overlook a broader end-to-end process and synthesise data sets

Improving Unstructured Data Analysis

Unstructured data refers to text-heavy information that doesn't fit into traditional row and column databases or pre-determined data models—emails, social media posts, audio files and videos. Unstructured data is intimidating because of its volume, variety, and velocity; much of it is being produced quickly. Studies indicate that up to 80% of enterprise data is unstructured. Unstructured data comes in three forms:

- Textual data: emails, documents, customer reviews, invoices
- Media data: videos, images, audio files
- Sensor data: Internet of Things (IoT), temperature sensors, smart devices,

Artificial Intelligence, or more specifically, machine learning (ML), can process unstructured data almost automatically, utilising **two different variations:**

Optical Character Recognition (OCR) converts images into machine-readable text.

- Character recognition software - the ability to read the text like humans
    - E.g. Scanning a physical invoice using a camera, the software will recognise the invoice number, amount, and due date and automatically enter it into the system
- Intelligent word recognition
    - Eg. The recognition of unconstrained handwritten words and processing of such into computer-readable text

Natural Language Processing (NLP) can effectively understand and analyse textual data.

- Sentiment Analysis - provides sentiment labels (negative, neutral, positive) at a sentence/document level.
- Opinion Mining - provides granular information about the opinions related to words
    - E.g. A customer might review a product saying the battery life was too short. The sentiment analysis system will note that the negative sentiment isn't about the product itself but the battery life and, potentially, battery quality.

Automation and Cross-checking of End-to-end Business Processes

This type of AI can be further broken down into three parts:

- Automating business processes so employees can focus on other jobs (RPA)
- Gaining insights through data analysis
- Engaging with customers and employees to resolve frequently asked or simple questions

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Robotic process automation (RPA) is the most common implementation of AI in an end-to-end business process. This includes back-office administration and financial activities. Such examples could include:

- Transferring data from emails or voice recordings to automatically update customer files and personal details
- Reading legal and contractual documents to extract changes and updates from previous versions

While these are the least expensive and easiest to implement, these applications aren't programmed to learn and improve since they are tasked to complete one part of a business process and complete it without errors.

Cognitive insight is the act of using algorithms to detect patterns in vast volumes of data and interpret their meanings. For instance, this includes predicting what a particular customer is likely to buy, automating personalised targeting of digital ads, and analysing warranty data to identify safety or quality problems.

These models are trained to improve over time while handling large amounts of data. Their ability to use new data to make predictions or put things into categories improves over time. Examples could include:

- Classifying unknown spending or bank transfers into specific categories and providing a confidence percentage. A human can then cross-check this to improve the accuracy and train the model
- Analysing data from an Excel document much faster than a human with strong Excel skills
    - E.g. User can pass in the information and then declaratively ask questions about the dataset without having to handle the data
- Comparing two reports (say one from June and the other from July) and identifying any trends or differences in numbers and the potential causes of such differences.

Eg. "*The new feature uses machine learning to predict the contact and account code for transactions that cannot be matched to invoices or bills using an organisation's bank rules, Xero's matching logic, or memorisations." - Xero 2021*

Lastly, **cognitive engagement** communicates with customers using NLP or, more colloquially, chatbots. Most large businesses use chatbots as their first point of contact for complaints and queries to speed up responses to frequently asked questions. This could be external or internally facing.

Examples of AI Integrations with Xero

Booke.ai

"Booke.ai is the all-in-one bookkeeping solution designed to streamline your business. Powered by cutting-edge AI technologies, our app automates the categorisation of transactions, fixes coding errors, and enables seamless communication with business, saving you countless hours."

Features include:

- Automatically put a category and export uncategorised statements and line items to Xero based on the analytics
- AI automation for efficient month-end close
- Error detection functionality for bookkeeping

Chaser

"Chaser is Xero's leading accounts receivable app, designed for businesses selling on payment terms. Chaser users:

- *Get invoices paid 16+ days sooner*
- *Save 15+ hours per week on accounts receivable tasks*
- *Reduce days sales outstanding by 25%+*
- *Maintain great customer relationships."*

Features include:

- Automate invoice chasing and streamline the accounts receivable process
    - Chasers will be sent from your usual email address, with your regular email signature and branding
- Optimise your accounts receivable process by building great customer relationships with automated 'thank you' messages on payment receipts
- Reduce late payments with SMS invoice payment reminders

Unleashed Software

Inventory management that is perfect for manufacturers, wholesalers and distributors everywhere. Thousands of product businesses in more than 100 countries worldwide rely on Unleashed daily.

Features include:

- Business Intelligence dashboards that track your product margins, supplier performance, purchasing and sales data, and more
- A mobile sales app for customer management on the road
- Automatic Purchase order, sales order and sales quote creation

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How to Most Effectively Use ChatGPT

ChatGPT is an example of “Generative AI” built on declarative knowledge. Declarative knowledge consists of explicitly stated or declared facts, meanings, concepts and relationships. Hence, a general tip for using ChatGPT is to always **ask a question or make a statement** that leaves as little grey area as possible.

For example:

Ask Questions like you Talk
Good Prompt: "What are some common symptoms of COVID-19?"
Bad Prompt: "List the symptoms of COVID-19."

Provide Context and Avoid Ambiguity
Good Prompt: "Write a blog post about the best ways to improve your public speaking skills. I want the blog post to incorporate specific speaking techniques. Limit the post to 350 words."
Bad Prompt: "Write a blog post about public speaking."

Use Keywords
Good Prompt: "Write a product description for a laptop with Intel Core i7 processor and NVIDIA graphics card."
Bad Prompt: "Write a product description for a laptop."

Examples taken from Priya Jamba, Scalenut.com

ChatGPT is trained on a massive amount of text data, learning to predict patterns and absorb factual information (this is where “training the model” comes into play). When ChatGPT generates a response, it's based on patterns it learned from the data, not by accessing an explicit repository of facts. (De Matteis, 2023). Here are some simple tips to get more out of ChatGPT.

Provide Context and Identity

Since AI models tend to spit out falsehoods occasionally, starting with a good descriptive prompt is essential. By providing some explanatory text, ChatGPT is more likely to pull from the correct data and learn from old patterns.

Thousands of prompts can be found here: https://github.com/f/awesome-chatgpt-prompts

E.g. *I want you to act as an accountant and devise creative ways to manage finances. You'll need to consider budgeting, investment strategies and risk management when creating a financial plan for your client. In some cases, you may also need to advise on taxation laws and regulations to help them maximise their profits. My first suggestion request is “Create a financial plan for a small business that focuses on cost savings and long-term investments".*

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Understanding ChatGPT's Limitations

"In some cases, the words most likely to appear next may not be the most factually accurate. For this reason, you should not rely on the factual accuracy of output from our models. - Given the technical complexity of how our models work, we may be unable to correct the inaccuracy in every instance." - OpenAI terms and conditions

This essentially refers to the fact that ChatGPT doesn't have the ability to decipher between what is true and false. This ties back to the point about hallucination. ChatGPT is not connected to the internet without 4.0. This means it cannot access new information or update its knowledge in real time. (This is doable with the Webpilot plugin, however). The data in ChatGPT only dates up to 2021. Therefore it can't give the latest news or information or the most recent compliance documents

ChatGPT also has a maximum output of 3000 words. This may require you to split large documents or questions into different parts

Using Variations of ChatGPT

There are thousands of APIs with different purposes and target different business sectors. While ChatGPT is a good starting point, it may lack specific knowledge about niche topics. For example, ChatCPA builds on ChatGPT's model with an extensive range of texts from FASB, IASB, IRC and beyond. These texts will also be up to date with the latest compliance and regulation needs and surpass the advice that ChatGPT will output.

https://www.linkedin.com/company/chatcpa/

ChatCPA is available for $8 AUD per month. → A free trial can be requested

Future of AI in Accounting

While the future of accounting is undeniably intertwined with the transformative power of AI, we are still far from the days of a world with no accountants. As AI technologies continue to advance, they are said to "*revolutionise every facet of the accounting profession. From automating routine data entry and transaction processing to enhancing data analysis and financial forecasting, AI is set to make accounting more efficient, accurate, and insightful*". While this is to an extent true, the biggest hurdle is adapting existing processes to incorporate AI where there is substantial benefit compared to the input.

For example, at Trihalo Accountancy, Xero is already deeply engrained in business processes with arguably minimal manual data entry required. An argument can be made to automate invoice uploads or timesheet input, but without existing integrations into Xero, this would be difficult to implement without altering entire business processes. Cost versus reward comes into the conversation, and at the moment, the time benefits that could be gained aren't worth the effort to develop personalised AI software.

This comes back to the question, is Trihalo Accountancy an accounting or software firm? While the impact of AI on the future of accounting is exciting and transformative, it is essential for accounting firms to embrace AI technologies and leverage their capabilities rather than trying to tailor-make an automatic process from end to end. Many accounting practices are limited to what is out there in the market, and while it is good to speculate about what can be done in the future by technology, it isn't technically feasible at the moment. Rather, attention should be diverted to saving a few minutes by utilising technologies like ChatGPT to re-organise data or automatically reply to an email. This is arguably more valuable than automating one specific business process, which could become redundant in the future.

ChatGPT sparked an outstanding amount of debate around the power of AI, but the reality is AI has been around for a long time. For example, the moment you save an invoice in Xero, AI helps generate summations for accounts and update journal entries to facilitate perpetual inventory maintenance. 95% of the time, AI does the dirty work behind the scenes, but the media focuses on the 5% of the time where AI does incredible things. This has skewed individuals' perspectives on AI and its capabilities.

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