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Why accountants should embrace Machine Learning

AI and ML are enabling tools that take the tedious gruntwork out of accounting, freeing up professionals to provide valuable insights – as well as professional scepticism – which are sought-after services no machine can replicate. **BY BENJAMIN LEE, GARY PAN AND SEOW POH SUN**

RECENT technology advancements have placed Artificial Intelligence (AI), along with its subfield of Machine Learning (ML), at the forefront of transforming the accounting industry. Major accounting practices are starting to implement ML to streamline their operations with the aim of achieving time and cost reduction, increased productivity and improved accuracy.

Before adopting ML, it is important to differentiate between ML and analytics. Analytics is the analysis of quantitative data to gain insights from the data with the objective of being able to make informed decisions. ML is an analysis method which uses mathematical algorithms to train computers in the processing and analysing of large amounts of data, allowing them to generate rules, recognise patterns and make classification predictions. One common ML technique is the use of neural networks – an algorithm designed to function the same way as a human brain.

This should be good news to accountants as repetitive, manual and tedious tasks can now be handled by computers while they can focus more of their efforts on higher-level, more sophisticated tasks that involve professional judgment and interpretation to provide clients with insights.

Here are some examples of ML-enabled accounting tasks:

TARGETED SAMPLING IN AUDITS

The potential for ML to drive a radical change in accounting is immense. As a first step towards moving away from random audit sampling, ML can start with "targeted sampling", where the machine can identify risky transactions based on the attributes it has learnt from what auditors deem as risky.

Classification algorithms (such as "decision trees") will be able to export these as easy-to-understand IF-THEN rules such as:

IF claim is from X Department, claim is submitted while employee is on leave, claim category does not match claim purpose, AND amount exceeds S$100, THEN it is a risky claim.

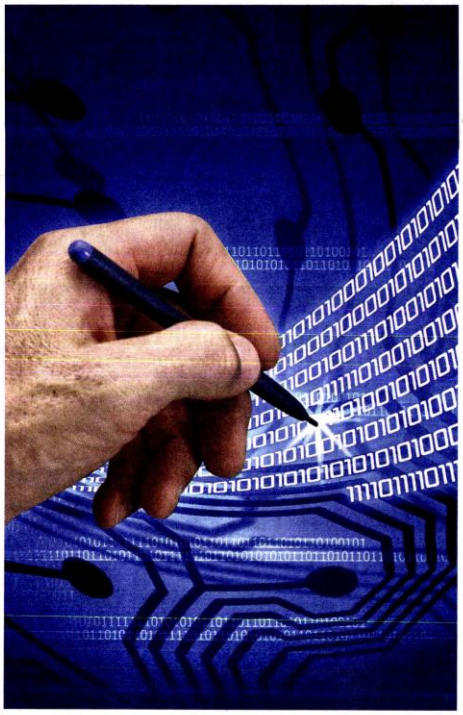
Auditors may argue that they are able to identify the same risky transactions by relying on professional judgment and their years of experience. The beauty in ML here is that it can construct rules beyond mere intuition and may find new rules which auditors did not pick up previously, all of which are quantifiable because there is an algorithm behind all of it.

SPEND ANALYTICS

Another area to which ML can be applied is in Spend Analytics – the analysis of expenditure data to help procurement departments make better purchasing decisions and improve compliance monitoring.

Clustering methods can help classify items with similar properties together, allowing for better categorisation of spending patterns. Applying them to procurement of services will enable ML to classify cleaning, painting and pest control services under the umbrella of "maintenance services". This can be extended to the "service provider level" based on the logic that similar service providers are likely to provide similar types of services. This will be useful for the relevant departments to monitor spending within the category as well as across categories.

Probabilistic ML methods (incorporating probability theory in making predictions) will always have an element of error in its results but this can be minimised by using larger datasets to train the models. Text analytics and web crawling can be adopted to derive information from textual data. The information is then analysed using natural language processing (NLP) – the processing and analysing of human language and speech. This will further improve the ML model's "vocabulary bank" and with a better understanding of context – which is essential to spend analytics.



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FRAUD DETECTION

Forensic accountants involved in fraud detection have already been using analytics actively in their field of work. This can range from the traditional statistical metrics (particularly averages) to Benford's Law and increasingly, ML techniques.

The most common ML application for anomaly and fraud detection is the unsupervised learning task of clustering. Unsupervised cluster analysis aims to learn patterns from within the data without predicting an outcome. In fraud detection, clustering helps to identify transactions that differ significantly from others (that is, outliers) and may be suspicious. This is used when there is no prior knowledge of fraud within the dataset.

Suppose there is another dataset that already has cases of fraud; then other ML techniques can be used to identify features that constitute fraud and these same features can be used in a predictive tool that can detect new cases of fraud.

THE MACHINE LEARNING HYPE

Beyond these, there are many other ML applications in accounting such as in detecting bid-rigging, money-laundering and compliance analytics. That being said, there has to be some measured expectations over the hype of ML and its applications to accounting. Yes, ML can transform and improve accounting, but it is not a magic wand that will "abracadabra" away all problems.

ML algorithms, like humans, start off untrained. In its infancy, it needs to be taught its ABCs, which come in the form of data; the more the better and thanks to "Big Data", this is not as lacking these days. The more examples they are trained with, the more they learn, the better they get and the more accurate their predictions will be. What may be lacking, however, is relevant data – and that is the user's responsibility to ensure.

For ML models to work well, they need to be continuously monitored, refined and improved upon especially when new data is made available. Before any of that happens, accountants need to overcome the inertia of adopting new technologies and take the first step of integrating ML into their work, which involves basic statistical learning techniques such as regression, for a start.

Taking this further, accountants must at least learn the fundamentals of how ML works and not blindly adopt it. There is a danger that when everything becomes "data-driven", numbers will be all that matters when, in fact, accountants should use these numbers to make informed decisions.

The accounting industry needs to recognise that AI and ML are enabling tools rather than adversaries out to steal jobs. After all, accountants are not mere bean counters susceptible to automation but professionals who provide actionable insights and their professional scepticism is not something a machine can replicate.

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