Treasury Technology: An Overview

Artificial Intelligence and Treasury Management Systems

TreasurySense

Introduction

Treasury technology is evolving at pace, analogous with the growth of markets, globalisation, and financial complexity. The additional demands placed on modern treasurers, from strategic liquidity management to M&A activity, necessitates the use of technology to meet these challenges.

In recent years, there has been an acceleration in available technology for treasury and, due to demand, many of them are now cost effective for even the smallest of treasury departments. Terms you may have heard of include big data, GenAI, machine learning, robotic process automation, and large-language models. This presentation will discuss these technologies, how they work, and how they can be utilised.

It is important to note that there is a high chance that your organisation is already using AI. For example, bank statement item categorisation and auto reconciliation utilises AI by using pre-defined rules, or algorithms, to analyse each statement line item and match it with a forecasted transaction.

We will have a general discussion about the current technology, define some relevant terms and look at how it all works behind the scenes using non-technical jargon. Second, we discuss treasury systems: benefits and challenges.

General Technology Overview

Definitions [1]

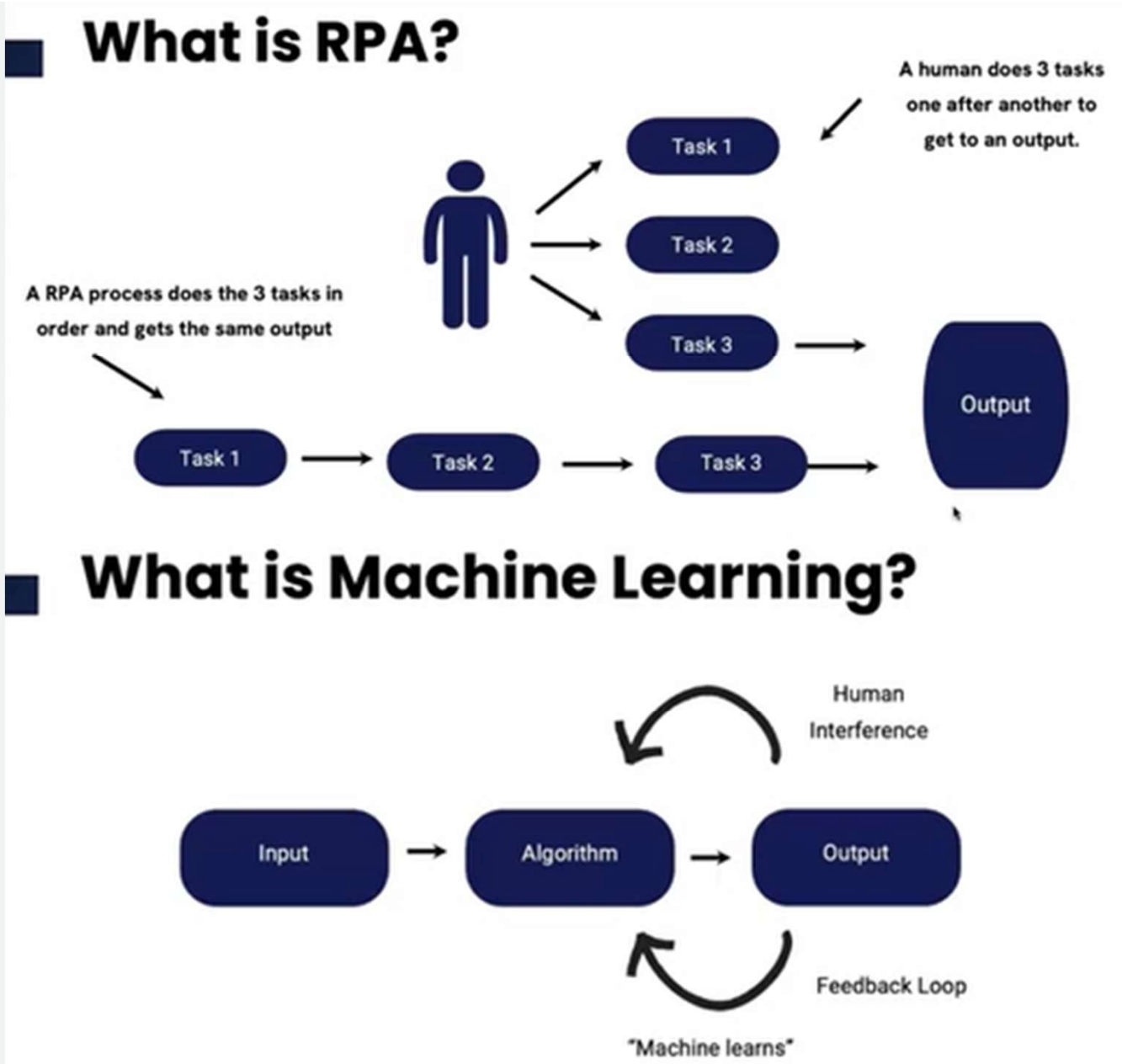
Artificial Intelligence (AI): Technologies with the ability to perform tasks that would otherwise require human intelligence. Commonly used terms are 'algorithm', 'machine learning', and 'neural networks'. **GenAI** is emergent tech that uses algorithms and large-language models ('LLMs'). It is used for content creation, e.g. to analyse regulatory impacts and scenario modelling. ChatGPT is an example.

Machine Learning ('ML'): Subset of AI, commonly used in finance, for example in credit scoring and forecasts. ML involves the development of algorithms based on the application of ***statistical*** models to large amounts of data - ***'big data'*** - that allow machines to learn, utilising feedback loops to improve output. At its core, ML is regression plus statistics. **Regression** is a tool used to derive and evaluate the relationship between a given variable (e.g. time) and one or more other variables (e.g. income).

Artificial Neural Networks ('ANN') replicate the behaviour of the human brain, and **Deep Learning** uses large layered ANNs to learn from big data. It is advanced ML.

Robotic Process Automation ('RPA'): A feature in a modern TMS, RPA replicates a series of pre-programmed tasks, usually performed manually by humans, within pre-set parameters, e.g. data entry.

General Technology Overview

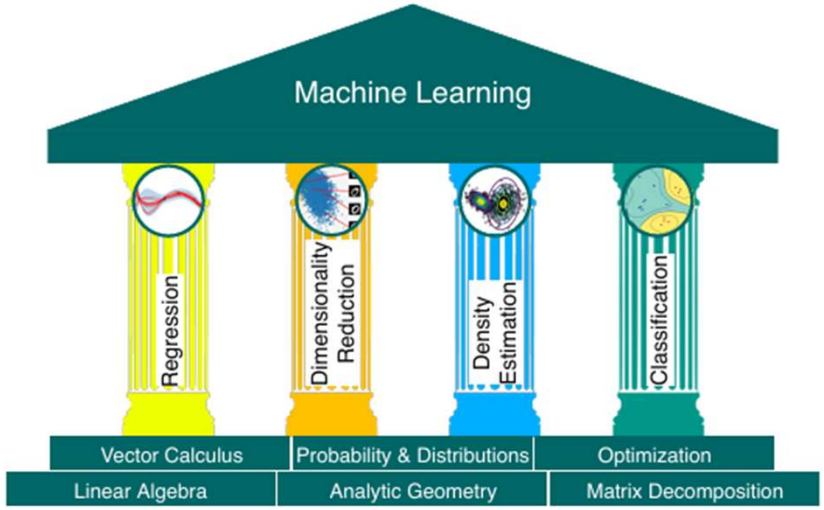


How Machine Learning Works

The picture on the right [4] shows the mathematical foundations and four pillars of machine learning.

Classification and **Regression** are common techniques used by treasury systems.

It is important to note, however, that regardless of the latest fancy sounding ML model that might be available to you, the model that performs the best against testing data is the one you should choose to employ.

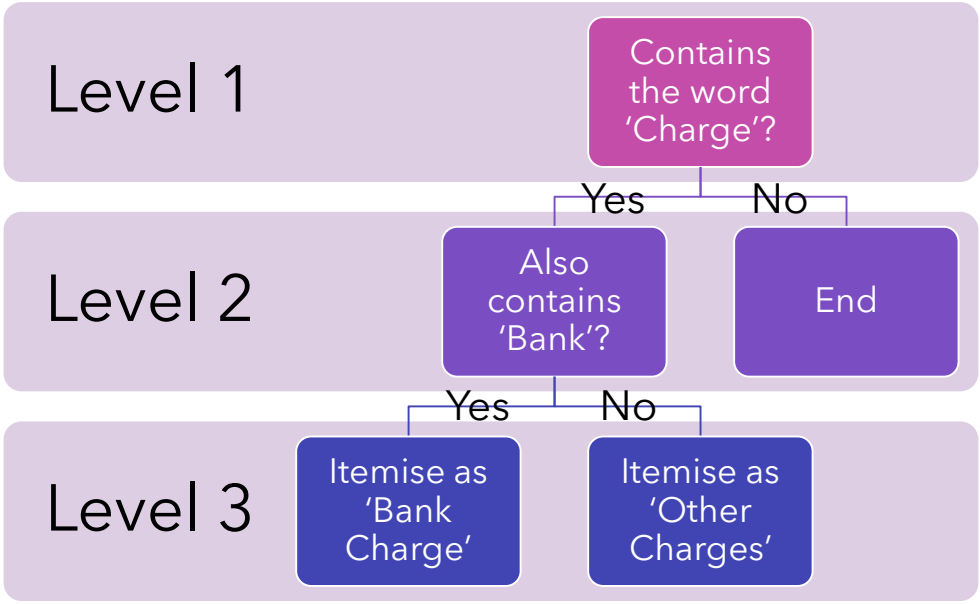


Classification

Generative AI automates transaction classification by quickly and accurately processing data based on its inputs and categorises accordingly. Classification Trees, for example, classify things into two or more discrete categories.

A typical treasury example would be the classification of bank statement items into pre-defined buckets which can then be analysed, matched to forecasted cash transactions and accounted for.

This can be demonstrated using a classification tree, such as that on the right. This is a very simple example of itemising a bank transaction using the information contained within a CAMT XML file (e.g. using the field <AddtlTxInf>).

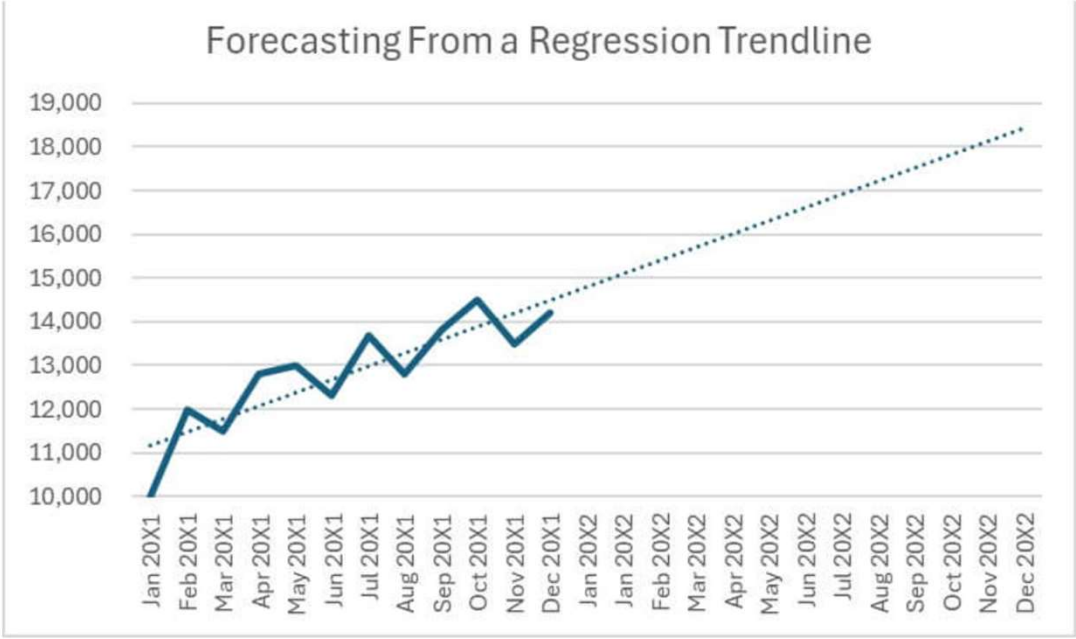


Regression

Regression is a statistical technique used to model the influence of one or more variables on another variable. This could be cash income vs time, or MMF return vs the FTSE100 return.

A typical but simple example is cash flow forecasting. Using a scatter plot with historic cashflow data, a line of best fit is drawn and extrapolated to forecast future flows. This is linear regression, i.e. straight line. There is also polynomial regression for more complex scenarios. There are of course more sophisticated regression techniques available, but the important thing is you should try a few and choose the one which best predicts your flows.

The main point is that ML is not using some special sauce or highly complex models to give desired results.



Treasury Management Systems

Incorporating a variety of RPA and AI functionalities, a modern TMS can be a game changer for the treasury functions position and importance in the organisation. The benefits of a TMS should be clear by now but as a reminder, below are the main ones.

Benefits

- *Automates manual tasks, thus freeing staff to focus on more value-add activities*
- *Increased cash forecast accuracy by analysing large amounts of historical data, identifying key cashflow drivers, and adjusting future forecasts as new data is introduced*
- *Control and visibility of payments, cashflows, and fees*
- *Scenario planning and modelling, using statistical methods*
- *Consider negotiating a lower external audit fee due more reliable data and controls, hence less audit effort*

Treasury Management Systems

Challenges

- *Data, data, data! To give meaningful results, there needs to be large volumes of data. This data needs to be of high quality, high integrity, and be complete. Challenges also arise from where and how it is stored, including its geographic spread, security, format, and confidentiality. This is the biggest challenge facing businesses adopting AI*
- *Business case: Demonstrate a conservative ROI, be clear on assumptions, socialise plans, gain internal buy-in*
- *Staff expertise*
- *Integration with current systems*
- *Implementation can be costly*

References

[1] ICAEW Corporate Finance Faculty, AI in Corporate Advisory, published online, 2019.

[2] Machine Learning in Business, John Hull, 2021

[3]The StatQuest Illustrated Guide to Machine Learning, Josh Starmer, 2022

[4] Mathematics for Machine Learning, Deisenroth et al., 2020