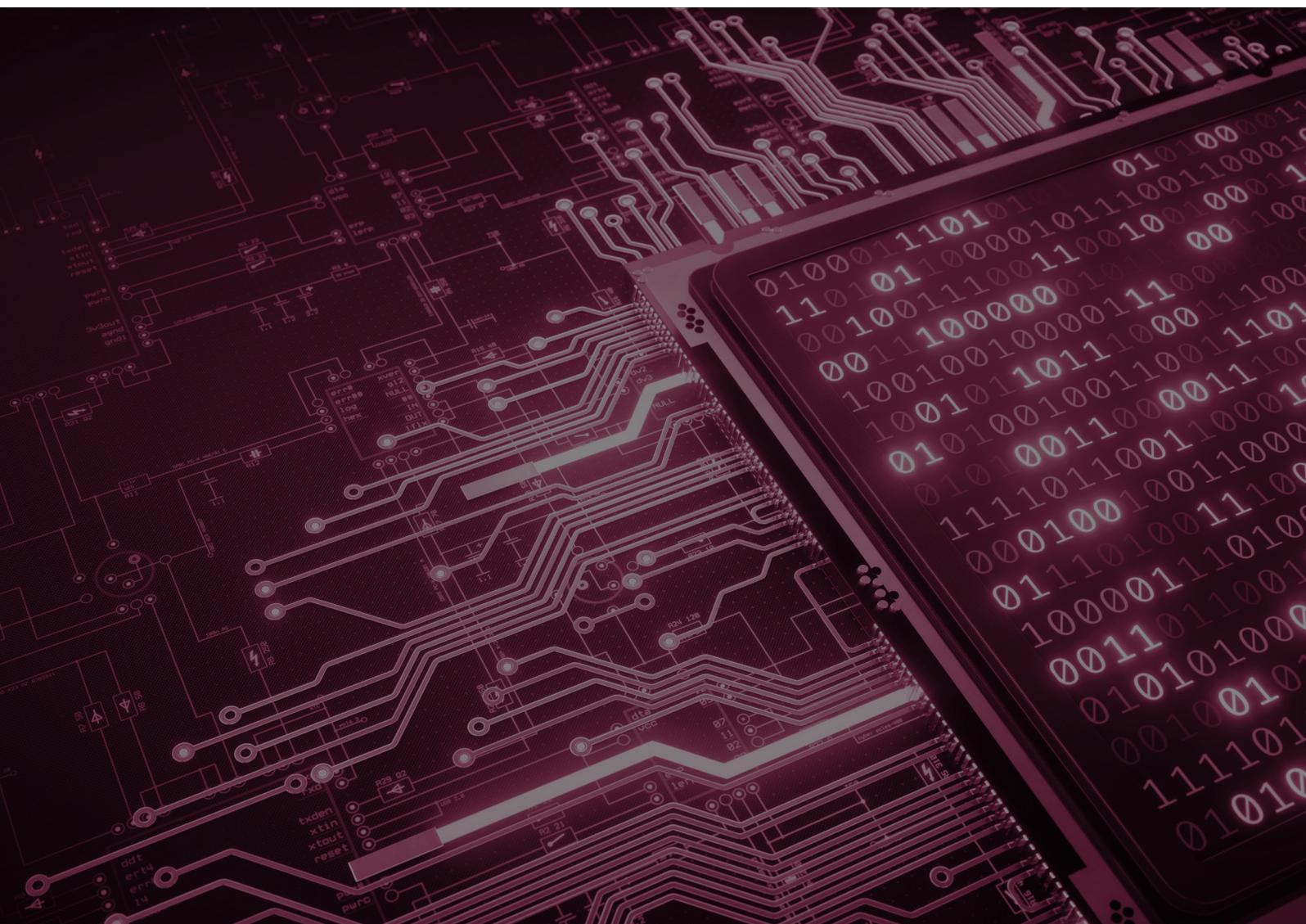# CAPCO | DIGITAL

WHY ARE SO FEW FINANCIAL SERVICES FIRMS REALIZING TANGIBLE BENEFITS FROM MACHINE LEARNING?

INTRODUCTION

Machine learning (or AI, when you want to make it sound more complicated) has well and truly entered the dictionary of oft-used corporate buzzwords in the last few years. You only need to look at the increase in the number of Google searches (see below) to see a steady increase in interest over the last decade.
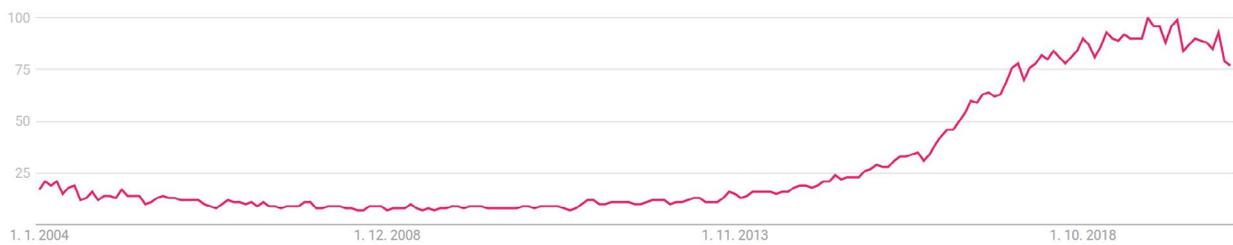

Figure 1: Interest over time in the term 'machine learning'. The number of searches is scaled to a number between 0 and 100 so 100 represents peak interest

So what actually is machine learning? Think of it as Software 2.0.[1] In traditional software (Software 1.0), rules are hardcoded such that specific inputs lead to defined outcomes. For example, if a customer alerts a company that they want to move to a competitor, some software could send them an email offering a 10 percent discount for the rest of the year. For machine learning (Software 2.0), the rules are not explicitly defined but are learnt using data. In our previous example, using historical data about which customers have left the company and which have not, an algorithm could be learnt to predict which customers are most likely to leave. It might be that low account usage is a particularly predictive factor. The marketing team could then use this information to decide to send them a discount voucher proactively rather than reactively. As it turns out, this use case, namely 'churn prediction,' is a common ML use case.

It is certainly true that technology companies have led the way in using ML to improve customer experience and increase revenue. Amazon uses powerful forecasting algorithms to predict demand for product lines ahead of time. Netflix's recommendation algorithm has been so successful that the company revealed that 80 percent of content is watched based on the algorithm's suggestions.[3]

Google, as you would imagine, makes extensive use of ML but in my mind one of the most striking is their subsidiary DeepMind using ML to reduce the cooling bill for their datacenters by a staggering 40 percent.[4]

> "
> *It will empower every business, every government organization, every philanthropy. Basically, there's no institution in the world that cannot be improved with machine learning.*
> "
>
> **Jeff Bezos**, Amazon CEO

However, in financial services (FS), ML is still a largely untapped opportunity. If you search for 'machine learning case studies in financial services,' you get a lot of results about how transformative ML could be and very few tangible results along the lines of, 'We implemented ML for this use case and saved $[x]m'. Sure, not every financial institution will choose to publicly talk about this, but the lack of concrete examples is particularly striking, particularly given the published use cases available in other industries. During this piece, we simply ask 'why is this the case'?

THE BARRIERS TO ML ADOPTION

There are certainly lots of reasons as to why implementing ML in a corporate setting is not easy. Gartner have done some extensive research (in all industries, not just financial services) on the state of AI adoption and the most frequent barriers preventing AI adoption:

Top 3 challenges to AI/ML adoption

Sum of 1 to 3 rank

Enterprise maturity

Skills of staff	56%
Data scope or quality	34%
Governance issues or concerns	13%

Fear of unknown

Understanding AI benefits and users	42%
Security or privacy concerns	20%
Measuring the value	17%
Risk or liabilities	6%

Finding a starting point

Finding use cases	26%
Defining the strategy	25%
Finding funding	12%

Vendor strategy

Integration complexity	26%
Confusion over vendor capabilities	10%

Figure 2: The most frequently cited barriers to AI adoption

These survey results are a great overview of the different reasons as to why ML adoption in the enterprise is not easy. ML is not unusual in that respect – history shows us that transformative technologies often take time to be fully adopted in an enterprise setting. In Capco's experience for financial services specifically, the main barrier to ML adoption in our industry is a cultural one: getting ML practitioners (often called data scientists) and management to understand each other better. Read on to find out more…

A FEW CAVEATS…

But first, some caveats. Machine learning doesn't work for all use cases and certainly isn't the nirvana that it is sometimes portrayed. If your data is patchy, badly structured and/or siloed, then a data cleaning or data rationalization project might well need to take place in parallel alongside your ML proof-of-concept. ML as a technology has similarities to the relational database innovations of the 1980s – both technologies are of limited use without data!

A good rule of thumb is that the more consequential each individual decision, the more cautious you should be about ML.

If the Spotify recommendation algorithm plays a song I don't like, it is not a big issue and I spend little time pondering why it chose this track before hitting the skip button. However, if a ML algorithm tells me that I have cancer after analyzing a scan, I will want to know how and why it came to that conclusion.

But there are lots of use cases in financial services where ML can be used appropriately and could make a huge difference. From our extensive experience in working with financial services firms, we think the following shifts in mindset are required.

FOR DATA SCIENTISTS…

When deciding whether to go ahead with a ML project, realize that your management will not necessarily be interested in ML per say, but interested in *whether it can solve their business problems*. This is a crucial distinction – people who have the internal resources to commit to ML projects are not likely to be as impressed as you are in the latest deep learning algorithm.

When the project has started, it is always important to aim for a least a few quick wins to help build trust. Although tackling the problem properly may take a couple of months, some meaningful insights along the way can help bring people along with you. Also, make sure that you always keep in mind the materiality of what you are working on. It might take a couple of weeks to increase the accuracy of a model from about 73 percent to 80 percent. But the real question is: to what

extent would business outcomes improve with this increase in accuracy? If the effect is negligible, then time is probably best spent elsewhere. On the subject of which, it is also important to appreciate that, depending on the use case, understanding why a model has made a prediction is often as important as the model accuracy.

At the end of a project that has got great feedback, bear in mind that it will probably still take a while to get your model into production and so to have a large business impact. Even if your ML approach for a particular problem is vastly superior to an existing process, do not underestimate the time it will take for people to change from a process that they are already familiar with. This time will also likely shorten as ML adoption increases in your organization.

FOR DECISION MAKERS...

ML will be able to have a large impact in your organization so fully leveraging this technology will put you at an advantage against your competitors. When beginning your ML journey, it is always best to start small, then test and iterate from there. An iterative approach will enable you to become more comfortable with ML and therefore feel more able to factor ML results into your decision-making process. So, rather than relying on just intuition and retrospective analysis, you can also take account of predicted future outcomes too.

Now, it is certainly possible to do this while appropriately managing the risk – it is imperative to start small before scaling. This iterative and agile approach will also help to get key internal stakeholders to trust ML decisions.

The benefits of machine learning are not a future hypothetical; they are happening now. A few use cases that have been implemented in financial services firms are:

- **Capacity modelling:** building a 'capacity calculator' to enable efficient resourcing in back-office functions

- **Reducing manual reviews:** automating the review of legal documentation[5]

- **KYC optimization:** predicting file completion times to identify bottlenecks in the KYC process

- **Predicting client profitability:** using ML to predict the profitability of clients, helping relationship manager to prioritize their time and unprofitable clients to be flagged.

HOW CAN FIRMS OVERCOME THESE CHALLENGES?

While the challenges of realizing significant value from ML might be daunting, it is more than possible. Capco's top three tips for ML success are:

1. Having a laser-like focus on solving high-value business problems, rather than simply doing interesting experiments or analysis

2. Starting small, testing and working in an agile manner to quickly uncover what is possible

3. Having a plan to implement successful work into internal dashboards and processes to maximize impact and awareness across the firm

SO, TO WRAP UP...

Machine learning is a transformative technology which, when used well, can help to reduce costs, increase revenue, and provide better customer experience. Fully realizing the benefits of machine learning certainly isn't easy but it is probably easier than you think to get started. To make the most of machine learning, a cultural shift is needed from both data scientists and decision makers.

Speak to Capco to see how our iterative and agile approach can be used to start or continue your machine learning journey.

REFERENCES

1. https://medium.com/@karpathy/software-2-0-a64152b37c35

2. https://forecasters.org/wp-content/uploads/gravity_forms/7-c6dd08fee7f0065037affb5b74fec20a/2017/07/Januschowski_Tim_ISF2017.pdf

3. https://www.wired.co.uk/article/how-do-netflixs-algorithms-work-machine-learning-helps-to-predict-what-viewers-will-like

4. https://deepmind.com/blog/article/deepmind-ai-reduces-google-data-centre-cooling-bill-40

5. https://digital.hbs.edu/platform-rctom/submission/jp-morgan-coin-a-banks-side-project-spells-disruption-for-the-legal-industry/

AUTHOR

Edward Pease, Consultant
Edward.Pease@capco.com

CONTACT

Jibran Ahmed, Executive Director, R&D
Jibran.Ahmed@capco.com

Riddhi Sen, Principal Consultant
Riddhi.Sen@capco.com

ABOUT CAPCO

Capco is a global technology and management consultancy dedicated to the financial services industry. Our professionals combine innovative thinking with unrivalled industry knowledge to offer our clients consulting expertise, complex technology and package integration, transformation delivery, and managed services, to move their organizations forward.

Through our collaborative and efficient approach, we help our clients successfully innovate, increase revenue, manage risk and regulatory change, reduce costs, and enhance controls. We specialize primarily in banking, capital markets, wealth and asset management and insurance. We also have an energy consulting practice in the US. We serve our clients from offices in leading financial centers across the Americas, Europe, and Asia Pacific.

To learn more, visit our web site at www.capco.com, or follow us on Twitter, Facebook, YouTube, LinkedIn and Instagram.

WORLDWIDE OFFICES

APAC	**EUROPE**	**NORTH AMERICA**
Bangalore	Berlin	Charlotte
Bangkok	Bratislava	Chicago
Gurgaon	Brussels	Dallas
Hong Kong	Dusseldorf	Houston
Kuala Lumpur	Edinburgh	New York
Mumbai	Frankfurt	Orlando
Pune	Geneva	Toronto
Singapore	Munich	Tysons Corner
	London	Washington, DC
	Paris	
	Vienna	**SOUTH AMERICA**
	Warsaw	São Paulo
	Zurich	

WWW.CAPCO.COM

CAPCO | DIGITAL