

The Future of ML and AI in Finance

Today's traditional financial institutions are at a crossroads: accelerate digitization and technological adoption to compete with the challengers who are rewriting the very rules of financial services, or be left behind, doomed to irrelevance in the age of artificial intelligence (AI). What will the future hold? To understand what's to come, it's important to take a step back and understand how the industry got here in the first place.

How We Got Here

What's unique about the banking and insurance industries is that they have, until recently, been some of the more data-driven types of enterprises. When they started collecting data and deciding to actually use it for something (we're talking the late 80s - [this is a good read](#) if you want a more in-depth, non-simplified history), it was small potatoes.

Data coming in was small enough to work with locally and, since analyzing data was new, insights were revolutionary (looking at some data is better than the previous way, which was looking at no data). Financial institutions thrived, leveraging analysts and Excel to stay on the cutting-edge.

But in the past 15 years, there has been an explosion in data. And over that time, today's traditional financial institutions have been collecting exponentially more (and more and more and more) data. Indeed, from weblogs to transactional data, the Internet of Things (IoT) and everything in between, no bank or insurance company today would say they have a data problem.

The Data Value Problem

What today's financial institutions have, whether they like to admit it or not, is a data value problem. That is, they struggle to gain real business value from all of the data (or any of the data) they're col-

lecting. For a variety of reasons, they have not been able to as easily shift into the area of machine learning (ML) and AI, which are the tools that allow businesses to get exponential insights from this exponential amount of data.

Instead, many banks and insurance companies are still trying to take on the massive amounts of data they're collecting with traditional business intelligence (BI), which is mostly reactive - taking past data and using it to influence future decisions in spite of the fact that our world today is fundamentally different.

With the enormous amount of data being generated today, we finally have basically up-to-the-minute information on what people do and evidence that consumer behavior can (and does) shift on a dime. What financial institutions should be doing instead is using predictive analytics and ML to do the following at scale (and, eventually with AI, in a partially or mostly automated fashion):

- Better and faster customer support
- Extremely manual processes (e.g., credit agreements or sorting through mail)
- Advanced fraud detection
- Risk assessment
- Customer lifetime value prediction,
- More effective marketing initiatives, like churn prediction or personalized marketing based on prediction of life events

(By the way, not exactly sure what ML is or how it's related to AI?

Enter: The Competition

It's clear that reactive analysis is no longer the answer. Yet traditional financial institutions are still doing it. Meanwhile, "data stars" have swooped in - namely GAFA, or Google, Amazon, Facebook,

Apple. But also Baidu and Alibaba or nimble start-ups like Credit Karma, Lending Club, Square, Lemonade, TransferWise and GoFundMe.

These competitors are data-native, leveraging the latest in ML and AI technology with top, young data science/data engineering talent from universities teaching the most cutting-edge techniques in not just big data, but unthinkably massive data. They are able to quickly innovate thanks to their use of largely open-source technologies like Scikit Learn, Jupyter Notebooks, Spark, and TensorFlow.

Inherent ML & AI Challenges

The reason many financial institutions haven't fully embraced the shift to ML AI is multi-faceted. Though from the way people speak about it (news coverage, popular culture, etc.) AI seems easy or like something that can be activated by throwing some money in and flipping the switch, it's actually a fundamental challenge that is organizational as much as it is technical.

Some common challenges include not having the right people, the right expertise, the right tools, the right motivation from leadership, the right mindset - the list goes on. On top of these challenges, which are industry-agnostic, financial institutions also face an increased regulatory environment that might discourage them from delving into the development of ML and AI capabilities.

Steps to Making it Happen

To be sure, traditional enterprises (especially in the financial industry) have a murkier path to success because they have to transform and optimize existing products and services step-by-step. Their business problems are not only technically difficult, but also difficult to work with.

As a consequence, these organizations need to adopt a more systemic approach by:

- **Setting Up a Reuse Methodology.** This means setting processes so that data and results can be effectively shared from one project to another. In a typical organization, 80 percent of data projects are started from scratch in an attempt to control what's happening. That's because reuse requires

some documentation and discipline. But come on! You can do it.

- **Allowing Multiple profiles to work on data projects together.** This means data scientists, of course, but also analysts and business people. Data science (and business-impacting insights) don't happen in a vacuum. Just as those on the business side don't know how to do hard-core data science, hard-core data scientists are usually not so in touch with the business. So collaboration is key.

- **Having a way to deploy to production at scale.** Again with the vacuum - data science can't happen inside one. Data teams have to be able to regularly push things out into the world instead of working in a sandbox and not having any real impact. Being able to do this seamlessly and quickly is critical to scaling insights from data.

Who's Already Doing It

Needless to say, the first wave of traditional financial institutions have already started moving toward the adoption of ML and AI technologies in order to compete with the younger, data-native startups and tech giants. For example:

- JPMorgan Chase recently appointed a head of AI research, a sign that the company is moving toward rolling out ML and AI initiatives across the business.

- Wells Fargo has made similar hiring moves and has been notably more vocal as of late on the importance of AI in the banking space.

- Bank of America reported that it spends \$3 billion developing and buying technology every year, and about three times that on keeping its existing IT infrastructure going.

Those are just these examples, and if the larger players are getting started, that means there will be even more space for innovation in the industry as well as competition for using ML and AI to deliver increased levels of service, better products, and more. Uses of these technologies will only get more creative as companies start to prioritize and hire top talent..