How NLP Helps Financial Services Companies Overcome 7 of Their Biggest Challenges

The financial industry is turning to natural language processing to address pressing issues like worker shortages, bias, compliance, competition from fintech, and more.

ABSTRACT

The coronavirus pandemic and other recent events have challenged financial services firms, requiring them to adapt and embrace new ways of doing business. To continue to be successful, these companies need to find bold, new ways to innovate that will allow them to operate more efficiently and effectively. Many are implementing natural language processing (NLP) technology to address some of the biggest obstacles they face.

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AN OPPORTUNITY FOR BOLD INNOVATION

Analysts and consultants agree: the financial services industry has reached a critical juncture. How firms respond to the current environment will determine whether or not they succeed in the decades to come.

Banks are at a make-or-break moment,” write the analysts at Deloitte. "The pandemic was the ultimate gut punch, testing banks' resilience in unforeseen ways. Yet, they are emerging stronger.”

Accenture agrees that the coronavirus has altered the industry in dramatic ways: "For banking, COVID-19 is a watershed event in real-time. While it is often difficult to recognize a turning point in the moment, rather than with the benefit of hindsight, the evidence in this instance is so striking that it is hard to refute.”

And the pandemic isn’t the only disruptor the industry currently faces. The trends toward mobile banking, digitization, blockchain, and cryptocurrency are challenging previous beliefs and requiring financial institutions to rethink their policies, procedures, and even their business models.

In such a moment, timid action will not suffice. Deloitte warns, "Now, more than ever, banks should be bold and aggressive in orchestrating change at the pace and scale that will drive results."

But what kind of action should you take?

For most institutions the answer is complex and involves a wide range of different technologies and approaches. But many are looking to artificial intelligence (AI) as a partial answer.

According to IDC, “Spending on artificial intelligence in the United States will grow to $120 billion by 2025, representing a compound annual growth rate (CAGR) of 26.0% over the 2021-2025 forecast period.” And a good portion of that spending will come from the financial services industry, which IDC forecasts will be the second-largest contributor to overall AI spending, behind the retail sector.

Much of that spending will involve a subset of AI known as natural language processing, or NLP.

THE BENEFITS OF NLP

So what is NLP?

In a nutshell, NLP is a category of software that allows a computer application to understand human language, either spoken or written. Many NLP tools rely on advanced machine learning technologies, including neural nets and deep learning to enable human-machine interactions that would have been unimaginable in decades past.

At its most basic level, NLP includes the voice-to-text and text-to-voice capabilities that have become a normal, everyday part of interacting with smartphones and other smart devices. At a more advanced level, some NLP systems can perform sentiment analysis to identify the likely emotions of a human speaker or writer. Some can translate from one language to another. Others can classify or summarize existing pieces of text. Some can even detect deception on the part of a speaker or writer. And perhaps the most common NLP implementation of all is the growing number of chatbots that are increasingly difficult to distinguish from human agents.
NLP technologies open up a world of new opportunities for financial services firms. It can enable you to become more efficient, more profitable, and more customer-centric than at any time in the past.

More specifically, it can aid in overcoming six of the biggest challenges facing the industry today.

1. TOO MUCH INFORMATION, TOO FEW EMPLOYEES

In the wake of the COVID-19 pandemic, companies in every industry are facing a talent shortage — and the financial services industry is certainly no exception.

Accenture writes, "The dire shortage of the technology, engineering, data and security experts needed by banks to realize their digital aspirations may get the headlines, but it tends to hide a much wider problem: banks’ appeal as first-choice employers of all kinds of talent has faded." And the same problem is afflicting insurance companies, brokerages, and other financial services firms. Workers are reevaluating their past choices and looking for employers that offer higher pay, the ability to work remotely, meaningful work, and/or better work/life balance.

And unfortunately, this worker shortage is striking at exactly the moment when banks most need people to evaluate and analyze text documents.

The amount of digital information contained in the world’s computer systems is growing exponentially, and the vast majority of that data is unstructured. That is, it’s in the form of text, video, audio, images, and other formats that are difficult to store in traditional databases.

Financial institutions need to analyze this unstructured data for a variety of different purposes. They need to evaluate annual reports, earnings calls, and analyst briefings to help determine whether or not companies are a good investment. They need to track media and social media mentions for themselves, their competitors, and potential business partners. They need to analyze contracts and loan agreements to evaluate potential risk. And they need to conduct research for a wide range of other reasons.

NLP technology can simplify many of these tasks.

For example, named entity recognition (NER) tools can identify when organizations that you are researching are mentioned in documents and flag them for follow-up. NLP tools can also highlight keywords in annual reports, allowing human readers to quickly home in on the sections that are of interest. NLP can even summarize documents, distilling the relevant information into small pieces that employees can act on quickly.

These kinds of tools could be useful across a large portion of financial services employees. Atos estimates that 40 percent of current banking roles have some responsibilities that could be handled by machine learning technology, and the numbers are potentially higher for insurance and brokerage firms.

Being able to use these productivity-boosting tools can start a virtuous cycle of ever greater efficiency. Studies have shown that having the right technology makes employees feel more engaged. That engagement, in turn, boosts productivity even higher, multiplying the effect.

2. BIAS AND HUMAN ERROR

Another huge problem financial institutions face is the prevalence of bias and human error, which can have enormous consequences for both companies and their customers.

The recent surge in civil rights demonstrations has many institutions questioning their own culpability in racial inequities. Similarly, the #MeToo movement and greater understanding of gender issues has many firms looking for ways to increase their support for women as well as transgender and nonbinary individuals. Many firms are actively trying to increase their diversity in hiring, loan approval, insurance policyholder, and investment decisions.
But social science research has proven time and time again, that human beings are bad at overcoming their inherent biases — even when they know these biases exist and have been trained to identify and resist them.

One possible solution lies in automating much of the work where bias and human error can influence decision-making.

The financial services industry already has a precedent for this kind of automation — today most investment trading decisions are made by computers acting on their programming rather than by humans. According to The Economic Times, as much as 70 to 80 percent of trading in developed markets is just this kind of algorithmic trading. And algorithmic trading not only has a better earnings record than human investors, it is almost much faster and more efficient.

Banks are already seeing similar gains by using NLP to automate commercial loan applications. Accenture notes that NLP has “eliminated 50 to 60 percent of the workload in commercial loan applications by synthesizing income statements, balance sheets, and footnotes into unified and adjusted statements.” By applying NLP to other parts of the industry — personal loans, mortgages, contract evaluations, employment applications, and more — the industry could realize similar gains in both accuracy and speed.

Importantly, this type of activity can also help companies meet the commitments they have made to societal good. “Bank executives also have a clear opportunity to lead the creation of an authentic, differentiated identity that embeds higher purpose,” says Deloitte. However, the firm also notes that “many banks have yet to turn their commitments to environmental, social, and governance (ESG) concerns into concrete action.”

Using NLP to combat bias can help financial institutions make good on their ESG obligations in a way that also improves and streamlines operations.

3. COMPLYING WITH INCREASING REGULATIONS

Financial services is one of the most heavily regulated industries in the world. And the regulations vary widely in different locations. Depending on where you do business, you might need to comply with Basel III, the Fundamental Review of the Trading Book (FRTB), the EU Financial Regulation, Comprehensive Capital Analysis and Review (CCAR), MiFID II/MIFIR, Solvency II, and/or numerous other regulations.

In broad terms, NLP can help financial firms comply with the rules that govern their business in two key ways. First, NLP can speed up many routine operations that are part of compliance processes. For example, many firms are required to conduct anti-money-laundering (AML) and know-your-customer (KYC) checks as part of their daily business. NLP tools can perform basic screening tasks to make sure that customers aren’t known criminals, and they can help analyze transactions to look for suspicious activity that could indicate criminal activity, like money laundering.

Second, NLP can add structure to unstructured data to help compliance teams identify and mitigate risk. For example, as part of their due diligence processes, firms can use NLP tools to analyze documents, tagging keywords, detecting themes, categorizing text, and monitoring for events that are associated with higher risk. The NLP tools can then direct the human staff to data that requires further review. Often the NLP tools are far more accurate at detecting potential issues than compliance teams would be on their own.

By speeding up compliance processes, NLP helps firms improve customer satisfaction and reduce operational costs. And by making compliance processes more effective, NLP can help firms avoid potential fines, legal fees, and/or loss of reputation that could result from failing to comply with their legal obligations.
4. FRAUD

Fraudulent activity has long been a major cost center for financial institutions, and during the last few years, the problem has gotten substantially worse. According to LexisNexis, "The cost of fraud for U.S. financial services and lending firms has increased between 6.7 percent and 9.9 percent compared with before the pandemic. Every $1 of fraud loss now costs U.S. financial services firms $4.00, compared to $3.25 in 2019 and $3.64 in 2020." And researchers are spotting similar patterns in other parts of the world.

A couple of different trends have contributed to this increase in fraud. First, mobile and online channels are simply more susceptible to fraudulent activity. Bots and identity theft make it easier to commit these kinds of crimes when transactions are primarily digital.

Second, because demand for homes has outpaced the available supply during the pandemic, housing prices have climbed sharply in many parts of the world. As a result, some people are finding it more difficult to obtain mortgages and might be tempted to falsify their mortgage applications. And the growth in online and mobile mortgage applications has exacerbated this problem.

Fortunately, the same NLP tools that help financial firms meet their compliance requirements can also help them combat fraud. For example, common fraud schemes might involve bots that make online requests for password resets or for duplicate credit or debit cards. NLP tools can identify words or phrases used by these bots that seem fake or are commonly associated with fraudulent activity.

NLP tools can also help financial services firms investigate red flags turned up by tools that monitor accounts for suspicious activity. Up to 98 percent of these warnings are false positives, but firms generally investigate them all. By using NLP to do a portion of this research, companies can reduce the resources they must allocate to this tedious task while increasing the likelihood that they will catch actual bad actors.

5. CUSTOMERS LOOKING FOR A HUMAN CONNECTION

Atos reports that two-thirds of financial transactions now take place online. This growth in online and mobile financial transactions has had a lot of positive impacts on both customers and financial institutions, such as greater convenience and increases in revenue.

However, it has also had a negative impact, namely an erosion of the trust that customers formerly felt for their financial institutions.

Accenture reports, "Between 2018 and 2020, the proportion of consumers who have full confidence in their bank to look after their long-term financial wellbeing dropped from 43 percent to 29 percent. Why? There are many reasons, but it hasn’t helped that bankers have stopped engaging customers in real conversations."

The pandemic drastically reduced the number of human interactions that people had on a regular basis. And while people like doing things online, they also crave the human touch, including from their financial institutions. That same report found that 7 out of 10 financial consumers would welcome a digital experience that includes human advice.

But how can institutions provide more human interaction when, as already mentioned, they are facing staffing shortages?

The answer, once again, may be to increase the use of NLP tools. If firms can automate many low-level text-related tasks like basic research and moving data from one place to another, that frees up time for them to have more — and more meaningful — direct interactions with customers.

Somewhat ironically, one use of NLP that may be particularly helpful in increasing the human connection with their financial institutions is chatbots.
Choosing the right infrastructure for NLP

In recent years, the field of NLP has been transformed by the increased speed and accuracy that is possible with today’s hardware and the shift from statistical machine learning methods to the use of neural networks and deep learning.

So what kind of hardware do you need for your NLP application?

When it comes to NLP, you need servers with powerful performance, flexibility, and scalability. One of the most popular choices is the Dell PowerEdge R7525 server with AMD EPYC™ processors and NVIDIA® GPUs. This data center powerhouse offers a number of features that make it ideal, including the following:

• **Blazing fast processors**: The R7525 has two AMD EPYC processors with up to 64 cores each. That allows the server to process a lot of different data in parallel, which is ideal for machine learning and other advanced data analytics.

• **GPUs designed for AI**: Accelerate your most demanding HPC and hyperscale data center workloads with NVIDIA® data center GPUs. Data scientists and researchers can now parse petabytes of data orders of magnitude faster than they could using traditional CPUs, in AI applications. NVIDIA's accelerators also deliver the horsepower needed to run bigger simulations faster than ever before. Plus, NVIDIA GPUs deliver the highest performance and user density for virtual desktops, applications, and workstations.

• **Plenty of memory**: Being able to hold more data in memory speeds analytics applications. With up to 4 TB of DDR4, the R7525 offers fast performance, even with extremely large data sets.

• **Scale-out storage**: Big data requires big storage. The R7525 supports up to 24 NVMe all-flash vSAN Ready Nodes, for maximum speed and data storage capacity.

• **Faster data transfer**: Thanks to PCIe Gen 4, the R7525 also transfers data much faster, helping to reduce overall latency.

• **Advanced security**: Healthcare organizations have extreme security and privacy needs, and PowerEdge servers offer cyber-resilient architecture. You can further enhance security with AMD Secure Memory Encryption (SME) and Secure Encrypted Virtualization (SEV).

The answer depends on your use case and your throughput needs. Some NLP applications run best on high-performance computing (HPC) clusters with dozens of nodes, accelerated with NVIDIA® GPUs, and fast storage. Other applications achieve excellent performance on engineering Validated Designs for AI. The Dell Connected Finance website can connect you with resources and Dell Business Advisors who can help you figure out which hardware would be best for your unique needs.

Most firms are initially drawn to chatbots because they represent an opportunity to reduce customer support costs. According to Juniper Research, “Operational cost savings from using chatbots in banking will reach $7.3 billion globally by 2023, up from an estimated $209 million in 2019.” In addition, “The research also found that AI, including chatbots, will have a highly disruptive impact on insurance claims management, leading to cost savings of almost $1.3 billion by 2023.”

But cost savings is only part of the story. Chatbots enable customers to solve their own problems and solve them more quickly, particularly as the technology improves. In fact, Juniper forecasts that successful banking chatbot interactions will grow 3,150 percent between 2019 and 2023.

As chatbots absorb many of the low-level interactions, smart companies are using the savings to free up personnel to spend more time giving customers the human attention and advice they need for solving more complex problems. It gives staff members time to engage in real conversations where they learn more about their customers and are able to upsell them on products and services. The end result is not only lower costs, but also improved customer satisfaction and potential revenue increases.

In addition, chatbot software feels more human every day. As NLP and conversational AI tools increase in their ability to understand and respond to human emotion, this can increase the connection between customers and financial services firms, even when human staff are not involved.
6. COMPETITION FROM FINTECH

For many years, the competition in the financial services sector was fairly limited. Yes, new firms entered different markets, but the barriers to entry were so high that few entrepreneurs were interested in founding new companies in the industry.

But that’s all changing.

Today, financial institutions face much more competition than in years past. And much of that competition comes not from other banks or brokerages or insurance companies, but from technology firms and fintech startups focused on disrupting the status quo. Companies like Chime, Alipay, Lufax, Paytm, Razorpay, WeLab, Adyn, Nexi, Klarna, Nubank, and dozens of others are giving businesses and consumers new options for making transactions, saving, and investing. Financial firms also must compete with tech giants like Amazon, Google, and Apple for some types of business.

The barriers to entry in this new, more digital marketing place are much lower than in the past. According to Atos, it takes just USD 50 million to set up your own digital bank. With investors pouring more than USD 50 billion per year into fintechs, it’s no surprise that more than 500 new fintech startups are created every year. And these startups have much lower costs than brick-and-mortar institutions with cost-to-income ratios below 30 percent.

This trend is particularly evident in Asia and Africa, where mobile banking has become the norm. Many individuals who have never before had a bank account are having their first banking experiences through a mobile device rather than through a brick-and-mortar branch office.

To remain competitive, banks must become more nimble and more efficient. And some of the most helpful tools for accomplishing those goals are AI and NLP technologies.

Certainly, NLP isn’t the solution to every problem facing financial institutions today. However, smart firms are investing in NLP as part of their ongoing efforts to innovate, become more efficient, and compete more effectively in the marketplace.

TO LEARN MORE

Want to learn more about natural language processing and other technologies that can help financial services firms innovate for the future? Check out the following links:

- **Dell Connected Finance** offers a wealth of resources designed to help you determine which technologies are the best fit for your needs, including analyst research, executive briefings, case studies, and more.

- **Transforming the Business of Finance** is an ebook from Dell Technologies and Intel that examines which trends are having the biggest impact on the financial services industry.

- **Proving the Art of the Possible with Natural Language Processing** takes a more in-depth look at NLP, with a particular focus on language-to-language translation, text-to-voice, and the Dell Technologies HPC & AI Innovation Lab.

- **Leveraging Natural Language Processing in the Enterprise** examines how enterprises in a variety of industries, including finance, are harnessing the power of NLP.

To learn more, visit DellTechnologies.com/AI.