Understanding Artificial Intelligence

Artificial intelligence has the potential to dramatically reduce costs and increase productivity in the financial services industry. AI has broad utility; it can help banks extend more credit, enhance the customer experience, improve fraud detection, lower the cost of offering services and more. With widespread adoption of AI comes challenges, however, including a lack of regulatory clarity, complex systems integration and a need to develop niche expertise before incorporating the nascent solution into a bank's platform.

About AI

AI is a catch-all term that generally refers to a number of technologies capable of analyzing data and identifying patterns to make a decision and effect an outcome.

Machine Learning – allows systems to learn and improve as new information is made available without specific programming instructions.

Robotics Process Automation – allows organizations to automate tasks across applications and systems as if a human were performing them.

Natural Language Processing – allows systems to understand the semantics of conversational language.

Speech/Object Recognition – allows systems to identify objects or words within images and understand spoken language.

The revolutionary potential of AI has long-captured the imagination of the public. A combination of technological advancements, increased interconnectedness and the granularity of available data have led to both real-world applications and renewed excitement about the technologies housed within AI. As AI continues to evolve, access to systems that utilize it will become increasingly available to even the smallest financial institutions.

Opportunities

AI is drastically changing the financial services industry's scope of and approach to operations, which can positively affect institutions' earnings. In fact, ABA and Accenture estimate that the adoption of AI-powered technologies can bring bottom-line value of $6.7 billion for community banks by 2020.

Machine learning will enable banks to extend more credit by improving decisioning models. AI tools can help banks deepen their customer relationships in the digital era, helping ensure an intuitive user experience across platforms. AI-powered regtech will reduce fraud losses and the cost of regulatory compliance so banks can profitably serve more customers. These benefits also bring about improved operational efficiencies.

Lending

AI has the potential to improve the underwriting process, expand credit access and provide a more seamless borrower experience.

Traditionally, banks have made financing decisions based on conventional metrics (e.g., credit scores). Lenders can use machine learning, however, to incorporate nontraditional data like a company's daily sales or web traffic into their credit decisioning engines. This process is sometimes referred to as advanced credit analytics. Advanced credit analytics can reduce delinquency rates and allow banks to extend credit to more qualified borrowers with thin or nonexistent credit files—a $2 billion revenue opportunity.[1]

Many banks allow customers to apply for financing online. By incorporating robotics process automation into online lending platforms, approval and underwriting times are reduced, allowing banks to extend financing to more applicants, individuals and businesses alike. This allows borrowers to more quickly receive loan approvals and, in turn, funds.

For example, Boston-based Eastern Bank developed an automated process for gathering underwriting data that reduced loan processing times from three-to-four weeks down to five minutes or less. Automation allowed the bank to reduce or eliminate time-consuming manual tasks, such as "filling out 58 fields of information on a computer from a paper application, completing a checklist of 19 items and printing out 10 additional forms to forward to loan processing."[2]

As such, lower underwriting costs, more accurate assessment of risk and quicker funding decisions can potentially benefit both banks and borrowers.

Customer Relationship Management

In today's increasingly digital world, fewer customers are visiting their local branch and more are turning to their mobile device to conduct financial transactions. This can make it more challenging to develop deep and trusting customer relationships, a critical piece of community banking. With AI, banks can bridge the gap between digital convenience and strong customer connections.

---

[1] The ABA Fintech Playbook

[2] The Wall Street Journal: The Coffee-Break Loan - Business Owners Promised Money in Five Minutes

Every time a customer touches their phone or swipes their card, they create a data point that can be used to get to know them better. This data is often unstructured and siloed across banks' disparate legacy systems. AI can help banks better leverage the data to enhance customer support, provide custom recommendations, increase customer acquisitions and reduce customer attrition. In fact, the ABA Fintech Playbook estimates that customer analytics represent a $1.2 billion opportunity for community banks by driving up customer engagement and conversion rates.

Financial wellness platforms provide customers with an intuitive way to track their finances, set savings goals and receive timely advice—and are a promising avenue to offer personalized customer recommendations. Machine learning can help a bank analyze consumer behavior, spending habits and specified goals—resulting in tailored advice for the individual customer.

Some financial wellness apps have started to incorporate natural language chatbots into their platforms. These virtual assistants help customers complete transactions and solve problems, and help banks offer round-the-clock customer service. Language processing and speech recognition enable chatbots to understand the specific context of a customer request—a new way of customer communication and engagement.

Chatbots in production today are fairly simple, but the technology is increasingly moving toward giving advice, automating client interactions and prompting customers to act.[3] The ABA Fintech Playbook estimates chatbots could represent bottom-line value of $1 billion for community banks by 2020.

Bank of America launched the Erica assistant chatbot in 2018. Erica can help customers view bills, schedule payments, transfer money between accounts, send money to friends, lock and unlock debit cards, and find past transactions. When Erica debuted at the Money 20/20 event in 2016, the bank included a demo video showing how the chatbot might provide more personalized advice. In the video, Erica prompts the user with an opportunity to save $300 over the course of a year. When the user clicks the text, Erica advises, "Based on your typical monthly spending, you have an additional $150 you can be putting towards your Cash Rewards Visa. This could save you up to $300 per year."

Machine learning can also refine bank marketing and proactively reduce customer attrition. One use case in production today is a solution offered by Alpharank. Banks can convert transactional data into an anonymized customer graph to how customers are connected to each other. By identifying high-value customers and the communities to which they belong, banks can enhance their marketing efforts to increase customer conversions. Alpharank can also help banks pinpoint unsatisfied customers and their respective communities in order to hone in on the problem and proactively communicate to the affected customers.

Not all banks are in a position to take advantage of AI in the near term. Marketing Central Information File (MCIF) is an alternative to AI, and can also be used to detect patterns in non-standard data. The MCIF contains the actual data from all disparate systems used by the bank, including transactions. The information is normalized into households where you can see exactly what products and services the customer has and uses.[4]

---

[3] FSB AI and Machine Learning in Financial Services: Market Developments and Financial Stability Implications

[4] Marquis's ExecuTrax, ABA Endorsed, also has daily and real time responses triggered by events and activity. If the purpose is to automate marketing, this might be worth exploring.

Risk and Compliance

AI-powered regtech[5] has the potential to lower the cost of regulatory compliance, allowing banks to profitably serve more customers.

As regulators issue new rules and proposals, natural language tools can comb through the text to help banks identify applicable requirements and potential compliance risks. This capability could help compliance staff more easily connect regulatory requirements to bank operations and establish necessary controls. Important information could then be flagged and sent to relevant individuals within the organization.

AI can also facilitate efforts to analyze data across the organization, providing compliance officers with a more holistic view of risks. Rather than remembering or manually searching for each relevant regulation, a machine learning algorithm can scan bank policies and procedures, disclosures and other documents—highlighting where regulation or guidance is likely to affect operations.

JPMorgan Chase's COIN (short for Contract Intelligence) software, which the bank implemented in 2017, reviews commercial loan agreements.[6] COIN uses image recognition software to analyze legal documents and contracts, and machine learning to identify patterns and relationships to improve performance over time. According to the bank, COIN accomplishes in seconds what previously required 360,000 annual hours of work by lawyers and loan officers.

AI can also allow banks to better monitor internal risks. In fact, JPMorgan hopes to one day use COIN to analyze corporate communications. Natural language tools can monitor messaging and speech recognition can provide voice review of calls for insider risk management. These tools can replace time-intensive manual review efforts, freeing up compliance officers' time for higher-level priorities.

Cybersecurity

AI can also aid in identity validation and real-time antifraud monitoring.

Today, onboarding and verifying a customer's identity to both fulfill Customer Due Diligence requirements and reduce fraud is a manual, time-consuming task. It also relies on physical identification documents like a driver's license. AI can help automate a number of these processes, allowing banks to more quickly and accurately manage risks.

Rather than requiring customers to mail in identification documents to verify their identity, software that lets a customer simply upload an image of the front and back of their ID can be used instead. That image can then be automatically cross-referenced against global databases to confirm authenticity. Additional checks would still be required, however, to verify that the documents belong to the sender.

AI is also being applied to a new generation of biometric[7] authentication tools—such as behavioral biometrics that monitor how customers use their mobile devices—which provide continuous, seamless anti-fraud checks. In fact, ABA and Accenture estimate that voice recognition and biometric authentication could add $1.4 billion of value by 2020 through a reduction in instances of fraud.[8]

---

[5] **Regtech** refers to the application of technology to ease banks' regulatory compliance burden.

[6] Bloomberg: JPMorgan Software Does in Seconds What Took Lawyers 360,000 Hours

[7] **Biometrics** validate identification by measuring some intrinsic characteristic of the user, such as a fingerprint or retinal scan.

[8] View ABA's Understanding Regtech report to learn more about compliance technology.

Operations

Beyond improving the consumer experience and aiding in compliance practices, AI can also improve operational efficiencies.

Banks regularly engage in modeling and forecasting to, among other reasons, analyze the potential effects of risk scenarios on their financial conditions. To develop a forecasting model for this type of risk assessment, a large number of variables come into play. While banks house a tremendous amount of data, much of this data is unstructured and siloed.

Data analysis traditionally requires a well-organized and structured set of data with which a researcher could test specific hypotheses. Machine learning, however, can help a user analyze and draw valuable insights from larger, unstructured sets of data. Combined with automation, AI can reduce duplicative and manual efforts to more quickly analyze data. The end result is more time for staff to focus on strategic priorities.

ABA and Accenture estimate that process automation alone will drive a $1.1 billion revenue opportunity for community banks. This improved analytical capability has the potential to help banks develop better credit models and more accurately identify risks.

Challenges

In its AI and Risk Management paper, Deloitte notes, "the biggest challenge for firms [leveraging AI] is less about dealing with completely new types of risk and more about existing risks either being harder to identify in an effective and timely manner, or manifesting themselves in unfamiliar ways."[9]

While AI has the potential to drive transformational change in financial services, there are a number of risks and barriers to adoption banks must consider. Regulators will expect banks that deploy AI to be able to mitigate risks and explain AI-driven decisions. Community banks may need to coordinate with core processors in order to fully integrate AI solutions into their systems. Finally, banks may lack the required internal expertise to effectively deploy or leverage AI solutions.

Regulatory Uncertainty and Compliance

Regulators will expect banks to fully understand and manage all risks related to the use of AI. They will want to understand what inputs drive AI-powered decisions and what internal oversight processes banks have in place to monitor risks.

While machine learning can improve decision-making, banks will need to be able to explain which factors contributed to the final outcome. For example, if a borrower is turned down, banks will need to confirm that legally protected characteristics did not inform the decision. This is complicated by the ability of machine learning algorithms to learn and evolve without human instruction. Banks will need to ensure that AI systems are not using information to predict protected traits that may violate fair lending laws, such as race or gender. Therefore, these decision engines will need to be auditable.

Regulators will expect banks to show they understand AI-related risks and have controls in place

---

[9] Deloitte: AI and Risk Management

to manage such risks. As machine learning allows systems to learn and evolve at great speed, unidentified risks may consequently spread quickly and at scale. This might result in a more frequent need for the bank to review established controls.

Regulators will also expect banks that partner with external vendors to conduct robust third-party risk management. The nascent AI industry is still evolving and it is unclear who will win and who may lose. Solutions providers may face heavy consolidation in the next few years. As a result, it will be important for banks that leverage third-party AI solutions to create business continuity plans that address vendor failures.

Systems Integration

AI solutions are only as good as the data behind them. While machine learning can derive insights from unstructured data sets, the outputs are highly dependent on both data quality and quantity. The way in which data is integrated into backend systems will also influence its effectiveness. Banks that can organize their data into a single, clean set prior to integration will be best positioned to utilize AI to its fullest potential.

The behemoth task of organizing backend systems may prove particularly challenging for community banks, especially those that employ a core processor. These banks may have to coordinate with their cores to effectively integrate and leverage AI technologies—often a complex and expensive task.

Third-party AI solutions may also compete with the products and services offered by core processors, making integration even more complicated. This may incentivize core providers to increase integration fees or costs related to making data clean and readable. Banks should talk with their core processors to understand their options for leveraging AI.

Skills Gap

Banks are unlikely to have the necessary expertise to internally build and deploy AI solutions, as there is currently a dearth of AI skills in the broader labor force.[10] Institutions looking to recruit AI talent will find themselves competing with the likes of Google and IBM. However, bank boards and C-suite staff can work on building a base-level understanding of both the benefits and risks of AI so they are better equipped to identify opportunities in the market.

AI is expected to improve productivity and create new jobs in the market, but many fear that AI will displace workers. PWC suggests (in Top Financial Services Issues of 2018) that to successfully deploy AI, banks should share plans with employees so they can understand which jobs will change and how. "You'll need to address these concerns, offer training to help people adapt, and more. Be transparent."[11]

---

[10] World Economic Forum: The New Physics of Financial Services – How AI is Transforming the Financial Ecosystem.

[11] PWC: Top Financial Services Issues of 2018.

Policymakers

Regulators and policymakers have expressed a keen interest in how AI technologies are being used—and can potentially be used—in financial services. The House Oversight and Government Reform Information Technology Subcommittee has held three separate hearings on the potential of AI to affect change across many sectors. The committee aims to determine what, if any, steps congress should take to ensure safety and soundness. Similarly, In May 2018, Federal Reserve Vice Chair for Supervision Randal Quarles said the Fed is in the early stages of studying how the expanding use of machine learning in the financial sector may change its regulatory approach.[12]

Education

Crafting effective AI policy will require an understanding of both the potential benefits and risks of its use in financial services and beyond. Engaging with industry players is an excellent way to learn how real companies are actually planning, building and deploying AI products and services. Fortunately, many regulators have already taken steps to reach out to industry to better their understanding of the innovative developments taking place in the market.

The OCC's newly initiated Innovation Office Hours allow startups or financial institutions with innovative ideas to come together to discuss potential compliance implications. Likewise, in 2017 the CFTC unveiled the focal point of its efforts to promote responsible innovation and fair competition. LabCFTC is designed to both make the commission more accessible to innovators and educate the commission on new technologies.

Regulators in England are demonstrating how outreach to industry players can benefit all involved. In 2016, the Financial Conduct Authority (FCA) in the UK began hosting "TechSprint" events. TechSprints are two-day events that bring together participants across and outside of financial services to develop innovative solutions that address specific, shared industry challenges. TechSprints targeting consumer access, regulatory reporting and, most recently, anti-money laundering and financial crimes have been hosted.

Outreach such as those outlined above can benefit all parties. The industry benefits from greater clarity and confidence to pursue new ideas, regulators are provided with valuable insight about changes taking place in the market, and consumers enjoy secure, innovative products and services.

Regulation

AI has the potential to benefit both banks and consumers. However, regulatory uncertainty may discourage banks from adopting AI solutions. Many banking laws on the books today were written in an analog era and it is unclear how these rules will be applied to the use of AI in banking. Fortunately, regulators have a number of tools at their disposal—such as the ability to issue regulatory guidance—to clarify compliance expectations. For example, regulators may need to clarify their expectations regarding algorithm auditability and the use of alternative credit data.[13]

---

[12] Reuters: Fed's Quarles says paying 'a lot' of attention to spread of machine learning in finance

[13] ABA Comment Letter to CFPB re Alternative Data and Modeling Techniques

New rules or regulations may be required to address gaps in the analog rules of the past. If necessary, the rules should acknowledge the rapid pace of technological development. Any new rules should be principles-based and technologically agnostic where possible so they may adapt to quick changes in the market.

The adoption of AI will likely affect all sectors of financial services, though regulatory resources are limited. Deloitte says, "Given the breadth and complexity of AI use cases, regulators will need to use a risk-based approach to select carefully where to focus their limited resources." In other words, resources should be reserved where AI-related risks are highest. While it is important to ensure that AI-influenced lending decisions have not been made using protected information, for example, less transparency may be required to understand how AI identifies and limits instances of fraud.

BCFP No-Action Letter, Regulatory Sandbox

In 2016, the Bureau of Consumer Financial Protection (BCFP) finalized its No-Action Letter (NAL) program in an effort to reduce regulatory uncertainty and facilitate consumer-friendly innovation. While ABA is supportive of the Bureau's efforts, the narrow scope of the NAL program warrants important changes in order to succeed in its objective.

No-action letters are nonbinding agreements between individual firms and the BCFP. The nonbinding nature of the NAL creates a level of uncertainty for recipients. While the Bureau signals its lack of intent to bring enforcement actions, there are no assurances against future fines or penalties for companies acting in good-faith. No-action letters need to provide certainty of outcomes. When a bank is building a product that it believes conforms to existing regulations—but wants certainty that regulators share their interpretation—it should be able to seek clarity through an NAL.

According to the Bureau, NALs do not equate to interpretations of law. This limitation restricts the utility of NALs for the broader market. No other companies experimenting with innovative products or services can rely on existing NALs as a basis for their own compliance. The Bureau could provide greater clarity to the market by issuing advisory opinions regarding the use of technology in banking.

Coordination between regulators is key. A bank is only as innovative as its least innovative regulator. Currently, NALs only apply to the Bureau— no other regulatory entities. A favorable interpretation at one regulator needs to be considered at others to be useful. Furthermore, programs designed to encourage experimentation need to be useful to banks and startups alike. Coordination is critical for this, as banks often have more regulators than monoline fintechs. Attempts to reduce liability under state law and potential opportunities to coordinate with state attorney generals would help create more certainty for industry.

Beyond NALs, there are other ways for regulators to encourage responsible innovation that is beneficial to consumers. There is room for both an NAL program and a regulatory sandbox. When existing rules prohibit the adoption of a new technology or innovation, banks should be able to work with regulators to assess benefits and risks, and work together to design rules to allow these products to be offered safely through some form of regulatory sandbox pilot program.

Any program must be clearly pro-consumer. It is possible to waive specific requirements without weakening consumer protections, but the process for assessing requests must be transparent and efficient. Currently, digital lending company Upstart is the only firm that has received an NAL from the Bureau, following a lengthy application process. Given the Bureau's requirement that a product must be near market-ready, a quick response, even if it is a summary dismissal, is important when preparing to launch an innovative product.

Conclusion

AI has the potential to deliver transformational change in financial services. It can expand access to credit, improve the customer experience, reduce regulatory burden, improve operational efficiencies and more. However, there are still a number of barriers to adoption. Banks need a strategy around systems integration and the right people with the right skills to effectively leverage AI.

Regulatory uncertainty will also likely persist through the nascent stage of AI adoption. Education is critical to regulators crafting effective policy that encourages the responsible adoption of AI. Where possible, regulators should maintain technologically agnostic policies that focus on the activity rather than the facilitating technology, and resources should be dedicated where the most risk resides. Outreach between industry and policy makers will be critical to identifying supervisory gaps and enabling the benefits of AI.