The Future is Now: How Artificial Intelligence is Transforming Banking

Examples of financial institutions that are already embracing AI, and a road map for banks and credit unions that want to transform the way they serve their customers.

For: C-suite banking executives

By: Nathan Snell

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Executive Summary

Artificial intelligence (AI) and machine learning have received significant press in recent years, yet the promise and opportunity is sometimes obscured by fear and uncertainty among the general public and financial services executives alike.

Despite the financial industry's rich history of embracing new technologies to improve customer service and operational efficiency, it has lagged retail, manufacturing, healthcare and other sectors in implementing effective AI solutions.

In this white paper, we explore several compelling use cases for AI, why financial institutions should embrace the opportunities inherent in cognitive technologies and present a road map for forward-thinking banks and credit unions to use in transforming the way they engage and serve their customers.

Introduction: Artificial Intelligence—an Idea Whose Time Has Come

Michael Knight
"I need ya, buddy!"

KITT:
"Right away, Michael."

- KNIGHT RIDER

HAL 9000
"I'm sorry, Dave, I'm afraid I can't do that."

- 2001: A SPACE ODYSSEY

iPhone User:
"Call me an ambulance!"

SIRI:
"From now on, I'll call you 'An Ambulance,' OK?"

- YOUR IPHONE

The Perception: AI is Scary and Will Cost People Their Jobs

Artificial intelligence (AI) has tapped a rich vein in the public's imagination. From light-hearted takes like Knight Rider, The Jetsons and Her, to disturbing visions of a dystopian future taken over by sentient humanoid robots in epic fantasies like Westworld, Blade Runner and the

Terminator franchise, popular films and television shows have revealed both the limitless promise and foreboding malice of this technology.

Perhaps no character best exemplifies modern society's fear and obsession with AI as HAL 9000, from Stanley Kubrick's 1969 film, 2001: A Space Odyssey. HAL's onboard computer controlled every aspect of his company's mission to the far reaches of space, including the lives of the human crew. Eventually, the computer's learned intelligence and instincts for self-preservation grew so acute, it plotted the mass murder of its human counterparts.

Thank you, Hollywood!

Although the renowned futurist and Google director of engineering Ray Kurzweil predicts that AI will surpass human intelligence in the next few years[1], scientists and ethicists continue to debate the likelihood of artificial intelligence ever reaching a level of sophistication where such dark futures become a reality. In the meantime, the real-world potential of this revolutionary and rapidly-evolving technology is already reaching critical mass. AI and machine learning technologies have been deployed effectively across multiple industries and applications, from online shopping and customer service to manufacturing and healthcare. Once outlandish Jetsons-era concepts like self-driving vehicles, chatbots and virtual assistants are already impacting our daily lives.

Despite the rhetoric, robots aren't stealing jobs from workers. They're creating better ones.

Yet many workers fear that robots will replace their jobs. As with the introduction of other technological breakthroughs throughout history, such as the cotton gin, combustion engine and the Internet, some level of disruption is unavoidable. Certain occupational skills, particularly those easily replicable by machines, will become obsolete. But the promise of artificial intelligence is so great, it will also introduce hundreds of new, far more interesting jobs to the workplace. For example, when the Internet went mainstream in the 1990s it utterly transformed a diverse set of industries ranging from retail, music and travel, to publishing and transportation. Jobs were lost, but entirely new positions were created, including many that require advanced technical and creative skills and are highly-compensated.

The Reality: AI Will Make Existing Financial Services Jobs Easier and More Efficient

Ever since Henry Ford first introduced the assembly line in the 1920s, millions of factory workers have labored in mind-numbing, repetitive jobs, hour after hour and week after week. But since the 1960s, U.S. and Japanese auto manufacturers have steadily automated the assembly process through production line robotics. Today, in the U.S. and other industrialized countries, most heavy-goods manufacturing is done largely by machines, with humans functioning in primarily supervisory, technical and quality assurance roles. This revolution in manufacturing has had two positive impacts: it has released the worker from unhealthy, monotonous and inhuman repetitive tasks, and has made the production line more productive and efficient.

According to an October 2016 TechCrunch article, U.S. manufacturing output has increased by almost 40 percent, adjusted for inflation over the past two decades.[2] Meanwhile, roughly two million manufacturing jobs remain unfilled due to an aging workforce and lack of interest from younger workers.

The financial services sector represents the next frontier for the creative application of automation, in the guise of AI and machine learning. For example, some financial technology (FinTech) firms have introduced time-saving functions such as optical character recognition (OCR) for reading tax returns and other financial documentation, eliminating the need for humans to input data into the system. Such a relatively simple application of AI is saving workers hours of manual data entry and rekeying per week, while also reducing costly errors.

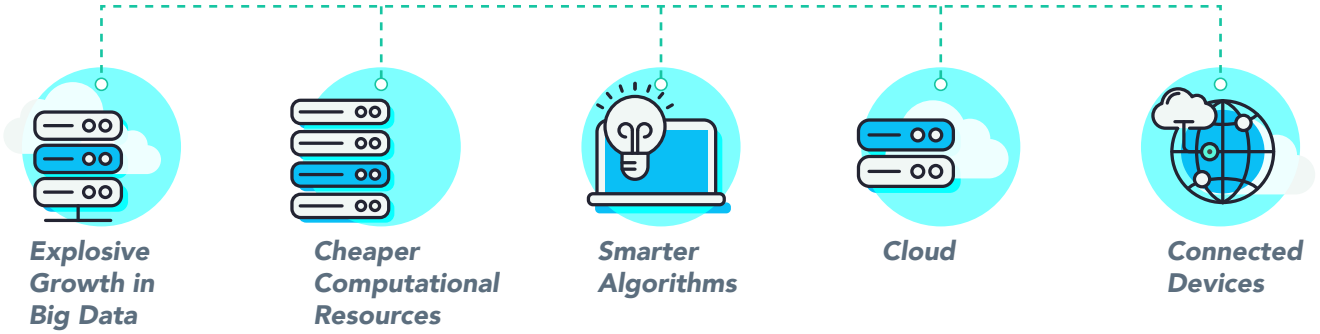
According to a Narrative Science research brief, revenues derived from cognitive technologies are expected to grow by a factor of six between 2016 and 2020, with financial

[1] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

[2] *"Industrial robots will replace manufacturing jobs — and that's a good thing," by Matthew Rendall, TechCrunch, Oct 9, 2016.*

Figure 1

Widespread adoption of cognitive systems across a broad range of industries will drive worldwide revenues from nearly $8 billion in 2016 to more than $47 billion in 2020 with banking named as one of the top two industries to lead the charge.



Source: The Rise of AI in Financial Services, Research Brief, Narrative Science, 2016.

services as one of the top two industries driving that trend (Figure 1).[3]

While it's true that numerous discrete tasks, and perhaps entire job descriptions, will eventually be replaced by machines, it's unlikely that AI will replace professional positions in the banking industry.

The real value of AI is in augmentation—the replication of human-like behaviors or tasks such as data entry, filling in documents and order-taking, that people don't want to do.

Many industry watchers and employees are optimistic about the prospect of machines taking over such functions, freeing humans to do what we do best. In addition, jobs of the future will require people to collaborate with machines to accomplish certain tasks. AI is not simply a binary equation, where either a machine or a person must do it all. The greatest strides in productivity and efficiency will be made when the full capabilities and unique attributes of both human and machine intelligence are harnessed.

According to a recent Accenture survey of 1,300 nonexecutive bank employees, 67 percent believe AI will improve their work-life balance, and 57 percent predicted increased career opportunities based on this trend.[4]

For this sunny projection to become reality, technologists and programmers must focus on evaluating each task to determine whether it is one that must or should be performed by a human. Will a human add value to the process, or is it mundane and repetitive enough to benefit from automation? In addition, the onus falls on the creators and developers to make this experience as seamless and intuitive as possible, making any so-called "retraining" of humans to work with machines unnecessary.

Artificial intelligence will undoubtably impact current jobs in the financial sector. According to Autonomous Research, AI will replace 1.2 million bank employees by 2030 (Figure 2).

Financial services companies that deploy AI wisely will realize a 14 percent net gain in jobs and a 34 percent increase in revenues by 2022.[5]

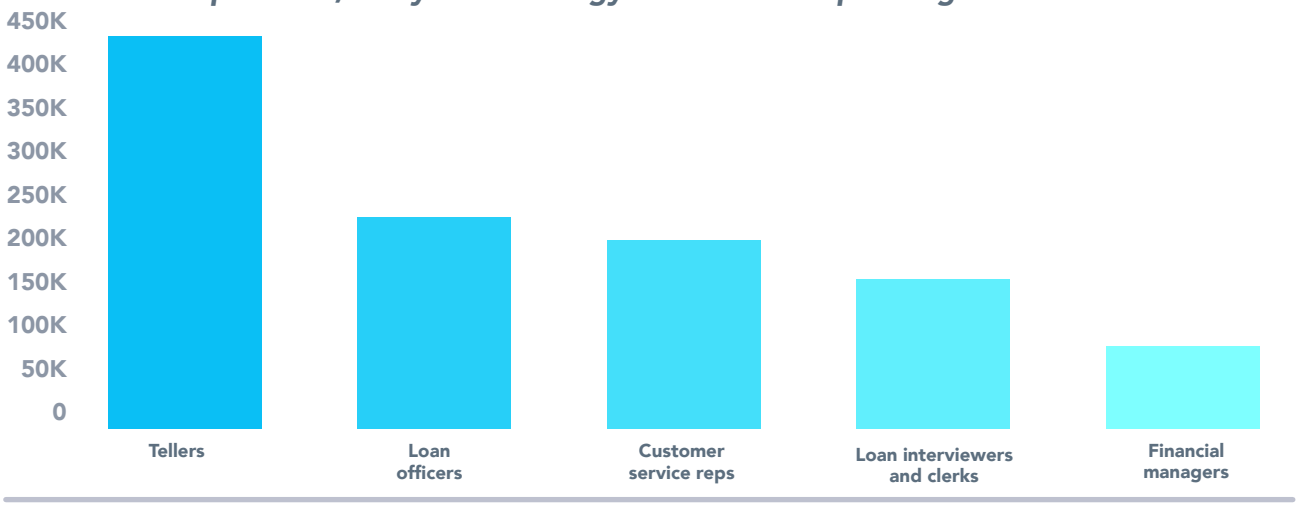
[3] *The Rise of AI in Financial Services, Research Brief, Narrative Science, 2016.*

[4] *"How artificial intelligence is reshaping jobs in banking," by Penny Crosman, American Banker, May 7, 2018.*

[5] *"How artificial intelligence is reshaping jobs in banking," by Penny Crosman, American Banker, May 7, 2018.*

Figure 2: Jobs That Will Be Transformed by AI

"Autonomous Research estimates that 1.2 million banking and lending jobs will be replaced by artificial intelligence software by 2030. At the same time, AI will create new entry-level positions, many in technology and relationship management.



Source: "How artificial intelligence is reshaping jobs in banking," by Penny Crosman, American Banker, May 7, 2018. https://www.americanbanker.com/news/how-artificial-intelligence-is-reshaping-jobs-in-banking

In the end, some jobs will indeed be lost, as monotonous, repetitive functions are taken over by more-efficient bots and similar technologies. But humans will still maintain a critical role, especially in areas where human empathy and the ability to connect and form relationships are competitive advantages.

Why AI Matters

Our new, exciting reality is that AI is here, and it is transforming financial services.

Bank executives have a choice: they can think strategically and plan now for how cognitive technologies will help them offer new products and services, deliver them more efficiently and serve their customers better. Or they can stand aside as customer expectations continue to evolve and more nimble competitors pass them by.

McKinsey Global Institute recently conducted a survey of over 3,000 North American and European business executives. More than two-thirds of self-identifying "extensive adopters" of artificial intelligence expected to see annual revenue growth topping ten percent. McKinsey concluded that "aggressive early adopters of artificial intelligence are reporting elevated earnings and may be forming 'an insurmountable advantage' over rivals."

"Companies failing to quickly embrace AI to improve growth risk falling further and further behind, paring their ability to attract top talent and leading to more concentration of market power within a few 'superstar' firms."[6]

Machine learning, a complementary technology to artificial intelligence, greatly favors early adopters. Through a compounding effect, first mover advantages are even more pronounced in a world of data and machine learning. It's like hiring someone fresh out of college and investing years in teaching them everything about the business. As the database grows and the machine increasingly learns about your institution's customer base, the algorithm becomes ever-more valuable.

[6] *"Study: Early AI adopters may gain 'insurmountable advantage,'" by Steve LeVine, Axios, May 24, 2018.*

Like the Land of Oz in the classic tale The Wizard of Oz, the world of AI is teeming with technicolor wonder and opportunity, yet rife with intimations of danger. Let us introduce you gently to this exciting new world:

Welcome to Oz

In her goal to ultimately meet the Wizard of Oz, Dorothy had to traverse an unfamiliar landscape. To accomplish this daunting task, she followed the guiding light of the yellow brick road. Likewise, to fully understand the enormous potential of artificial intelligence within the context of financial services, it's important to begin with an understanding of some key terms:

According to The English Oxford Living Dictionary, **Artificial Intelligence (AI)** is defined as "The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."[7]

The term artificial intelligence was first coined in 1956 by John McCarthy, a then-assistant professor of mathematics who convened a group of leading scientists for the Dartmouth Artificial Intelligence Conference. The purpose of the gathering was to explore "the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."[8] Today, the development of AI for commercial purposes generally uses human reasoning as a model but does not attempt to fully replicate human reasoning in machines.[9]

Machine Learning (ML) is defined as: "The capacity of a computer to learn from experience, i.e. to modify its processing on the basis of newly acquired information."[10]

Put another way, machine learning represents the ability of a system to compare observed reality with predicted results and apply these learnings to foster continuous improvement. Artificial intelligence doesn't always incorporate machine learning in its algorithm, but when it does, the model continually rebuilds itself, resulting in an extremely powerful and elastic solution.

Consider the chatbot, a common application of AI. Not all chatbots utilize machine learning; some are simply programmed to answer a wide range of common questions and remain in a constant, static state without learning from new questions posed by customers. When machine learning is added to the algorithm, however, it creates a far more sophisticated and powerful chatbot, one that can learn to anticipate unusual questions or requests, evolving to serve customers comprehensively and accurately.

Within the financial services sector, the understanding of the potential benefits of AI is high, with 80 percent of executives surveyed ranking their own awareness as either a 4 or 5 out of 5. Sixty-one percent of respondents to the same survey believed that AI is already mainstream or will be within two years.[11]

74 percent of banking executives believe AI will transform the industry.[12]

In fact, 37 percent believe AI will impact the banking ecosystem, peaking in the next two to five years.[13]

Artificial intelligence and related technologies, including machine learning, natural language processing and cognitive computing offer a broad array of current and potential use cases within financial services, ranging from robo-advice and next-product recommendations to anti-money laundering (AML) compliance and credit card fraud protection (Figure 3).

Most bankers are aware of AI. Most anticipate the transformative potential of AI and related technologies within the industry. And a strong majority recognize they will fall behind the competition if they don't act within the next two years.

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[7] English Oxford Living Dictionaries

[8] https://www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/#19f75e494f5d

[9] "Dartmouth Artificial Intelligence (AI) Conference," Living Internet, accessed June 22, 2018.

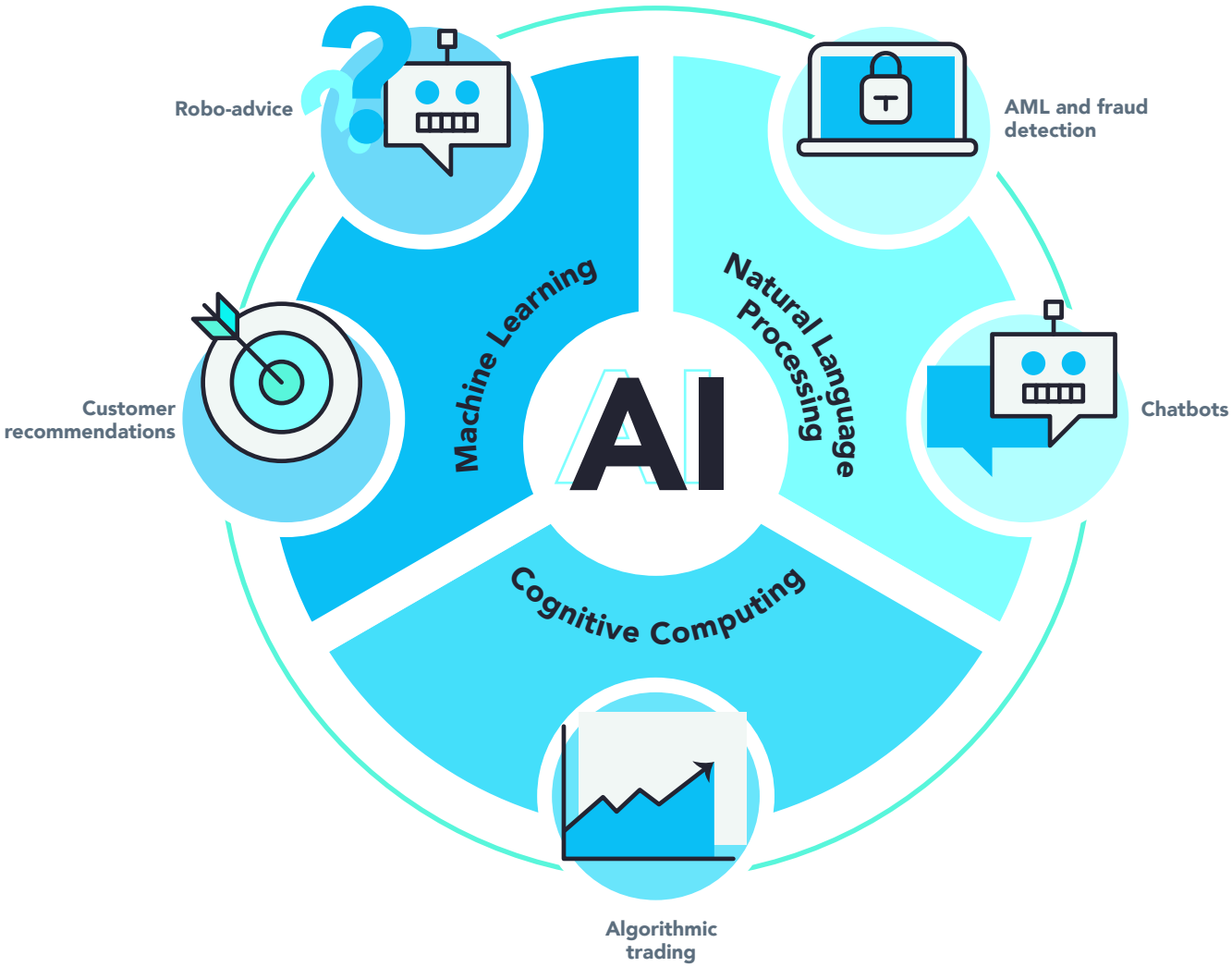
[10] English Oxford Living Dictionaries

[11] *AI In Financial Services: Next Steps To Realising The Potential, FinExtra/OpenText survey, April 2018.*

[12] *Jim Marous, The Financial Brand.*

[13] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

Figure 3: AI Applications in Financial Services



Source: AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.

Yet, banks have been slow to adopt the technology, lagging many other industries. Globally, only 15 percent of financial institutions have deployed an AI solution to date, while another 22 percent expect to go live in the next 18 months.[14] Larger financial institutions are deploying AI solutions more quickly than smaller banks and credit unions, with security and risk applications leading the pack, followed by personalization and communication applications.

In the next section, we discuss the reasons why banks have fallen behind in the race to implement artificial intelligence within their operations. Then we introduce three exciting areas of opportunity where AI and machine learning will transform financial services for decades to come.

The Challenge: Banks Face Roadblocks to AI Adoption

Financial institutions have long employed innovative and leading-edge technology, dating back to the installation of IBM mainframe computers back in the 1950s and 1960s. Yet it is this very legacy that is contributing to the industry's lack of agility and flexibility today. A recent study revealed

[14] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

that only 32 percent of traditional financial institutions are currently using any form of AI in their operations, including recommendation engines, predictive analytics and voice recognition.

Here are some reasons why banks and credit unions have struggled to bring AI to center stage:

Banking technology is complex: According to a National Business Research Institute survey of over 100 financial services executives, 12 percent of respondents that weren't already using AI blamed the technology for being new, untested, and risky. But the very nature of banking itself is highly complex, from the vast amount of customer data captured to Byzantine compliance requirements and strict regulatory oversight. A study by PWC reported that "operations, regulations, and limitations in budget or resources" obstructed two out of three U.S. financial firms from adopting AI solutions.[15]

Many banks still use on-premises hardware: Although most technology firms today develop their solutions in the cloud, many banking institutions have not yet moved off legacy on-premises servers. After heavy investments in physical technology assets over the course of decades, institutions are hesitant to make the leap. Moreover, because of onerous security and privacy regulations, financial institutions are required to undergo rigorous on-premises penetration tests. However, to stay competitive in today's fast-moving marketplace featuring FinTech upstarts, peer-to-peer lenders and challenger banks, traditional institutions must embrace cloud-based technology, which allows organizations to deploy new solutions and features quickly and securely through Agile development timetables and frequent updates and releases.

Siloed organizations and data: Particularly for mid- and large-sized institutions that grew over time through mergers and acquisitions, the problem of organizational and systemic siloes is significant. If a bank or credit union has not established a strong data governance policy, and is housing and running processes across multiple, disparate systems, it is difficult to implement cognitive technologies that provide a complete and accurate picture of the customer. Without this 360-degree view, the goals of enabling deep customer insights, efficient customer onboarding and customized next product offers based on need will never be realized.[16]

This challenge can be counteracted by deploying a single, end-to-end bank operating system across the organization. Via a truly holistic customer engagement platform, every employee is given access to the same information, allowing the right insights to be delivered to the right person at the right time in the right place.

Lack of vision and internal talent: To date, many financial institutions have struggled to establish a comprehensive internal strategy for implementing AI. This challenge is highlighted by the relatively few organizations that have an internal AI champion: according to Digital Banking Report, just 55 percent have identified an internal leader to oversee AI initiatives, and most of these executives hold the title of innovation head or serve in similar roles.[17] This is a good start, but it is not conducive to long-term leadership continuity as AI-enabled solutions move from the drafting board to the operational stage. It is evident that more institutions will need to hire visionary talent from outside their organizations, to ensure the successful adoption and use of these game-changing technologies.

Solutions that miss the mark: Despite numerous strong business cases for AI in banking, with the notable exception of risk management solutions, few compelling AI-enabled products are currently available on the market. To date, most solution providers in financial services have toyed with whiz-bang, "shiny object" uses for AI, yet haven't succeeded in packaging the technology in a digestible, understandable format that meets real-world market needs like more customized product recommendations, faster time to close and greater efficiency.

In addition to all these barriers, bottom-line focused institutions will demand to see demonstrable returns on investment (ROI) before rolling out AI-enabled solutions on a grand scale. Defined measurements of ROI and profitability such as improved efficiency ratios, win rates or net interest margin (NIM) will be crucial to the ultimate success of this promising technology.

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[15] *"Banks Eager For Artificial Intelligence, But Slow To Adopt," by Adelyn Zhou, Forbes, June 30, 2017.*

[16] *The Rise of AI in Financial Services, Research Brief, Narrative Science, 2016.*

[17] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

The Solution: Three Areas of Opportunity

Banking industry analysts predict that AI will introduce more than $1 trillion in cost savings by 2030, representing 22 percent of banks' current expense load. Nearly half of this estimated savings (49 percent) will come from reductions in branch networks and staff on the front lines. But the remainder will come from improvements in back- and middle-office operational efficiencies, in areas like regulatory compliance, customer authentication, and data processing, as well as in underwriting and collections processes.[18]

AI will introduce more than $1 trillion in cost savings by 2030.

In terms of the relative importance of various business drivers for the implementation of AI, enhancing the customer experience tops the list for financial executives, followed by cost reduction and improving back-office speed and efficiency (Figure 4).

We see several areas of exciting opportunity for AI in banking. Some, such as credit risk management, are relatively mature. Others, like customer onboarding and operational efficiency, have barely been touched. Forward-thinking technology providers and financial institutions will begin exploring these areas in earnest to address real pain points in efficiency, productivity, customer experience, risk management and customer insights.

To borrow an analogy from the theater, these areas of opportunity can be broadly categorized within three application domains: **Back of the House, Under the Lights and Behind the Curtain:**

1. **Back of the House:** Banks and credit unions have explored enhanced cognitive technologies in the back office for decades, particularly in the areas of credit risk and fraud detection. In fact, one of the earliest and best use cases for AI and machine learning was the development of the FICO score for credit approvals. Most major banks use predictive credit-scoring and risk-based pricing models, and many employ sophisticated teams of highly-educated data scientists to develop such methodologies.

   This continues to be an important area of focus, and research conducted in 2017 found that 70 percent of organizations cite fraud and security applications to be either "extremely" or "very" important.[19]

   But the back of the house offers so much more opportunity for the implementation of AI, from employee supervision and training, to operational efficiency and faster time to close.

   For example, with the help of AI and machine learning, Royal Bank of Scotland reports that it can now approve commercial real estate loans up to $2.7 million in less than 45 minutes.[20] Other banks are achieving even quicker throughput times.

   In the area of employee development and training, MetLife recently introduced AI technology to help its call center agents "be more human." The software, created by Cogito, monitors agents' energy levels, speaking cadence and responses to customer questions and alerts them to adjust their approach in real-time.

   nCino, the worldwide leader in cloud banking, recently introduced "nIQ," or nCino IQ, an intelligent chatbot designed to help bank employees quickly and accurately locate the knowledge they need to close a loan, navigate a workflow and offer the best solutions to their customers.

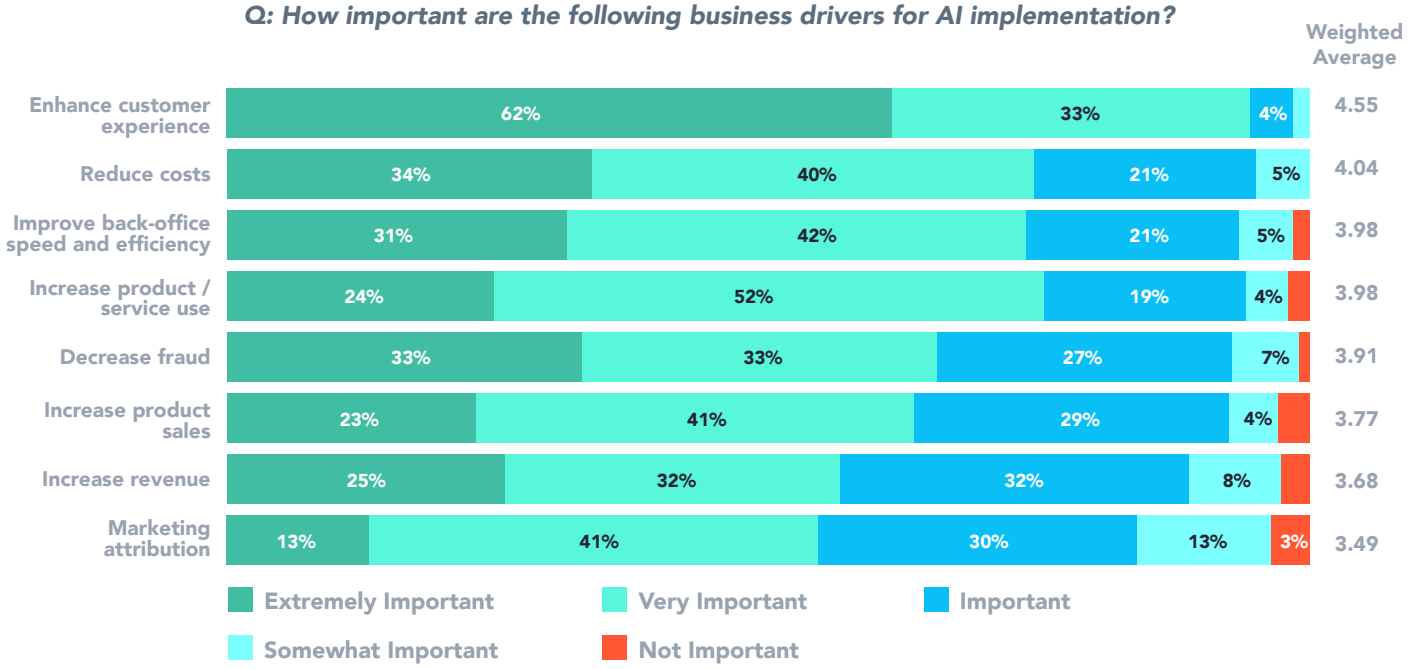
[18] *"Artificial Intelligence and The Banking Industry's $1 Trillion Opportunity," by Lisa Joyce, The Financial Brand, June 10, 2018.*

[19] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

[20] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

Figure 4: Importance of Business Drivers for AI Implementation

Q: How important are the following business drivers for AI implementation?



Source: AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.

Working behind the scenes and fully integrated into the nCino Bank Operating System, nIQ continually evolves over time through machine learning to become more accurate, relevant and useful. Instead of asking the user to navigate through multiple help screens to locate the answer to a question or problem, nIQ provides the exact answer, or brings the employee directly to the next page or stage in the account opening or onboarding process. nCino envisions nIQ as the next generation of workflow, in that it will enable bank employees to enjoy more natural, conversational and faster customer interactions and internal processes.

2. **Under the Lights:** Customer engagement continues to be an important emerging area of opportunity within financial services. Consumers comfortable with speaking to their Amazon Alexa-enabled devices, getting help via online chatbots or asking Siri for directions to the nearest coffee shop, expect their bank or credit union to create a user interface that is just as seamless, pleasant and easy to access.

With the benefit of enhanced customer insights, AI can be used to help deliver a frictionless and expedited onboarding process, eliminating unnecessary steps for both the customer and the institution. For example, chatbots are already using AI to answer common questions, automate repetitive tasks and customer requests, and deliver on-demand service more quickly.

Surveys have found that the customer experience was the most compelling AI business case for financial institutions, with over 80 percent stating that personalizing the customer experience and improved targeting was either "extremely" or "very" important.[21]

AI can also be used to enable voice digital assistants, simplifying and speeding up the initial customer interaction beyond what could be done through

[21] *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

traditional keystroke entry. Using voice prompts to ease the customer through the engagement and new product sales cycles can help improve, expedite and personalize the customer journey. Similarly, some institutions are moving beyond simply reducing the number of times information must be rekeyed into a loan or deposit account application, to "zero-keying," where a customer or member that has already provided information or documentation can simply respond to a product recommendation and accept an offer with a single click.

Bank of America began rolling out its virtual assistant, "erica" to its customers in March 2018, and by June had expanded the service to all its 25 million customers. Within three months of its initial launch, the popular app had already garnered a million users. One of the most popular uses of the technology is transaction search, particularly related to shopping sites like Amazon, Target and Walmart.[22]

The bank has also incorporated its financial literacy, budgeting and planning tools and content into erica, allowing it to deliver relevant videos and advice directly to customers based on the questions they ask. Customers can communicate with erica via voice, text or "tap and gesture." The digital assistant is fully integrated with Bank of America's call center technology, and customers are automatically authenticated, so they can connect with a live agent with a single tap within the platform without reidentifying themselves or re-explaining their problem.

Capital One Bank has garnered a reputation for innovation in AI and digital banking. Aside from being the first financial institution to begin offering Alexa-enabled services, Capital One introduced the first natural-language SMS chatbot among U.S banks, nicknamed "Eno" ("One" in reverse). The software converses with bank customers through text messages.

"Texting is the most widely used feature on the smartphone," says Ken Dodelin, VP of Digital Product Management. "Ninety-seven percent of smartphone owners text. So we thought that would be a good place for us to spend some time. Through Eno, folks can chat with us in natural language about their credit card accounts and their checking accounts, and we're able to have natural language conversations with our customers."[23]

One reason the bank has been able to move faster than most of its competitors has been the embrace of Agile development principles. This enables a relatively small group of internal product designers, developers and technologists to work together quickly and iteratively, allowing the bank to stay ahead of the curve.

Globally, banks are beginning to move fast. Singaporean bank DBS launched digibank, India's first mobile-only bank in 2016. As a branchless bank, digibank needed to find new ways to interact with its customers, so it partnered with third-party firms to develop solutions based on conversational AI and other emerging technologies. Today, it responds to over 80 percent of customer inquiries using chatbots.[24]

These examples highlight the larger trend of financial institutions deploying emerging cognitive technologies, such as voice in customer engagement. In the next ten years, 50 percent of all banking interactions will occur via interactive voice response (IVR).[25]

3. **Behind the Curtain:** Some of the most exciting and potentially transformative opportunities for financial institutions are occurring in the realm of cognitive insights. Like the eponymous Wizard in The Wizard of Oz, much of the magic of AI will happen behind the scenes. Through AI and machine learning, banks and credit unions can gain enhanced intelligence on their customers and prospects to make more accurate product recommendations and offer more relevant financial advice.

To be effective, financial institutions must move beyond a broad demographic understanding of their customer base. Cognitive technology takes traditional customer segmentation to the next logical iteration, where a massive data set is fed through an AI-enabled system,

22 *"Mad about erica: Why a million people use Bank of America's chatbot," by Penny Crosman, American Banker, June 13, 2018.*

23 *"Capital One Seals Tech Street Cred With Forays Into AI," by Mariya Yao, Top Bots, Apr 7, 2017.*

24 *"Banks Eager for Artificial Intelligence, But Slow To Adopt," by Adelyn Zhou, Forbes, June 30, 2017.*

25 *AI in Banking: The Next Frontier in Customer Experience, Digital Banking Report, Issue 250, September 2017.*

allowing the bank to subdivide its customer base into a virtually unlimited number of highly targeted segments.

As an example, Capital One uses machine learning to customize website content on the fly for each user, based on the individual's clicking and scrolling behavior during that session. In this way, a visitor viewing information on a credit card rewards program receives different offers from one comparing deposit account products.[26]

Through enhanced customer insights, AI can help the institution fully analyze buying behaviors and financial patterns, deliver real-time offers and product recommendations, and provide advice to help the customer solve an actual problem. The bank will become truly customer-centric, anticipating a customer's needs and desires in real-time, before they recognize such needs themselves. Only in this way will the bank be able to derive deep, actionable insights to provide better customer service and grow relationships.

To fully capitalize on the combination of deep customer insights and highly efficient and customized onboarding, the key is to have a fully integrated, single platform that can gather and analyze customer data across all touchpoints and sources.

Such a system allows the right insights to be delivered to the right employee in the right place at exactly the right time. It doesn't matter if the team member is sitting in the branch, in a central call center, on an iPad at the customer's business or in a mortgage center. Employees will have all the intelligence they need to fully serve a customer's needs and recommend a customized solution to them in that moment.

Conclusions

The time has come for banks and credit unions to embrace the untapped potential of AI and machine learning.

Those institutions that can successfully harness the enormous promise of using AI to automate back-office processes, gain valuable customer insights, and create a better, faster customer experience will win.

Banks and credit unions must take this opportunity to partner with innovative firms developing effective solutions for real-world use cases, especially in the areas of operational efficiency, customer engagement and customer insights. The key is to focus on seamlessly incorporating this technology into existing processes, while also maintaining a human touch with customers. In other words, to build AI solutions that engage employees and put the customer first. The most effective way to achieve this ideal is through deployment of a single platform, seamlessly integrating and analyzing data from all customer channels and across the organization.

Only then will the true wizardry and possibilities of AI be fully revealed.

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26 *"Capital One shortens the machine-learning curve," by Bonnie McGeer, American Banker, April 26, 2017.*

About the Author

About Nathan Snell

Nathan Snell brings a breadth of technology expertise and experience to nCino as a founding team member. As chief innovation officer, he leads the evolution of the Bank Operating System. Prior to nCino, Nathan served as system architect and product manager at Live Oak Bank. Before this, he was vice president of technology for National Speed. Nathan has advised numerous corporations, including The New York Times and Redbox, on technology strategy. He earned his bachelor of science in entrepreneurship from the University of North Carolina Wilmington.

About nCino

nCino is the worldwide leader in cloud banking. Through its Bank Operating System, nCino leverages the power and security of the Salesforce platform to deliver a complete banking solution. Dedicated to transforming financial services through innovation, reputation and speed, nCino's technology enables financial institutions of all sizes to expand market share, adapt to meet regulatory compliance, drive profitability and optimize operational transparency. Founded in 2012, nCino is headquartered in Wilmington, N.C. For more information, visit www.ncino.com and follow us on Twitter: @nCino.