

# Applying AI Strategically: How Banks Can Maximize the Opportunity

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Prepared for:



## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	3
INTRODUCTION .....	4
WHAT IS ARTIFICIAL INTELLIGENCE? .....	5
AI BENEFITS FOR CUSTOMER AND EMPLOYEE .....	6
COMMON AI USE CASES .....	6
RESULTS FROM EARLY ADOPTERS.....	9
THE ROLE OF HUMANS .....	11
AI IMPLEMENTATION CHALLENGES .....	12
DATA PREPARATION .....	12
FINDING TALENT .....	14
LARGE FINANCIAL INSTITUTIONS ARE DRIVING AI INVESTMENT .....	15
SUCCESSFUL AI SOLUTIONS REQUIRE THE RETIREMENT OF LEGACY THINKING.....	17
NEXT STEPS .....	19
ABOUT AITE GROUP .....	20
ABOUT AVANADE.....	20
AUTHOR INFORMATION.....	20
CONTACT .....	20

## LIST OF FIGURES

FIGURE 1: WAYS ARTIFICIAL INTELLIGENCE CAN TRANSFORM THE CUSTOMER AND EMPLOYEE EXPERIENCE.....	6
FIGURE 2: DATA INPUTS .....	12
FIGURE 3: THE USE OF STRUCTURED VS. UNSTRUCTURED DATA .....	13
FIGURE 4: THE USE OF CROSS-CHANNEL AND CROSS-PRODUCT DATA.....	14
FIGURE 5: AI SOLUTION DEPLOYMENT.....	15
FIGURE 6: AI SOLUTION DEPLOYMENT BY SIZE OF FI.....	16
FIGURE 7: AI MATURITY MODEL .....	17

## LIST OF TABLES

TABLE A: TYPES OF AI.....	5
TABLE B: OPPORTUNITIES TO USE AI DURING THE CUSTOMER LIFE CYCLE.....	7
TABLE C: USE CASES AND PROOF POINTS .....	9

## EXECUTIVE SUMMARY

*Applying AI Strategically: How Banks Can Maximize the Opportunity*, commissioned by Avanade and produced by Aite Group, explores how artificial intelligence (AI) can help financial institutions (FIs) transform the banking experience.

Key takeaways include the following:

- Most FIs are taking a tactical approach to AI in which siloed business units are approaching various AI initiatives with their own specific goals and use cases in mind. A number of early applications are in the back office, where there is opportunity for operational efficiency and cost reduction. Client-facing use cases include chatbots and interactive assistants, as routine tasks can be automated in those areas. While an ad hoc approach is to be expected, FIs need to replace this with a more strategic enterprise view to prevent overlap and duplication and learn from existing activities.
- Early adopters of machine learning (ML) and robotic process automation (RPA) technologies are already seeing significant benefits in terms of their ability to detect fraud, improve operational efficiency, enable new transactional activity, and remove friction from the customer experience.
- For them to learn, algorithms need to be exposed to large amounts of data. This needs to be clean, structured, and tagged correctly—getting the right data in the right place at the right time is essential to success. FIs that have a common data strategy across the organization will quickly roll out new AI initiatives across the organization.
- Although most FIs plan to add new talent incrementally in the AI space, the demand for data scientists is high and is expected to increase. Finding skilled resources in this area is challenging and will become increasingly so in the near future.
- The banking industry is moving from the age of machines aiding humans to one of humans aiding machines. As FIs consider how to use AI on a broader scale, they will have to consider the role humans will play in the process and especially determine when human intervention is required.

## INTRODUCTION

AI is being taken up across the financial services sector. It is being used in a variety of ways to enhance interactions with customers and employees. This white paper discusses the various types of AI and explores the following topics:

- Results from early AI adopters
- The role humans play
- AI implementation challenges

This paper highlights the pivotal role AI is increasingly playing in financial services and reveals why FIs that do not embrace this technology will increasingly find themselves at a competitive disadvantage.

## WHAT IS ARTIFICIAL INTELLIGENCE?

To understand the potential of AI, it's important to understand what the technology is and does. Often, the term AI is used interchangeably with ML, but ML is actually a subset of AI. AI is the branch of computer science that advances the development of programs that emulate human cognitive behavior. Many techniques under the AI umbrella are gaining traction in the financial services industry (Table A).

**Table A: Types of AI**

AI Type	Description	Example of uses
<b>ML</b>	ML encompasses analytics techniques that can identify patterns of behavior through iterative optimization.	Fraud detection, anti-money laundering (AML) detection, marketing analytics
<b>RPA</b>	RPA is the use of advanced analytic technologies to handle high-volume, repeatable tasks that traditionally require human intervention. <sup>1</sup>	AML, fraud, and back-office operational efficiency efforts
<b>Natural language processing (NLP)</b>	NLP is software that can read language and turn it into structured data. <sup>2</sup>	An emerging use of NLP is in conversational platforms. A conversational platform is one that uses NLP through text or voice to understand, process, and predict behavior; determine the next best action; respond by providing information; execute a request; and learn from the experience, just as a human would. This dialogue is a two-way interaction. In order to facilitate the interaction with a customer, conversational platforms stitch together multiple capabilities, such as NLP, predictive analytics, biometrics, and ML. <sup>3</sup> In addition, some FIs are exploring using NLP as first-level support in the call center voice response unit.

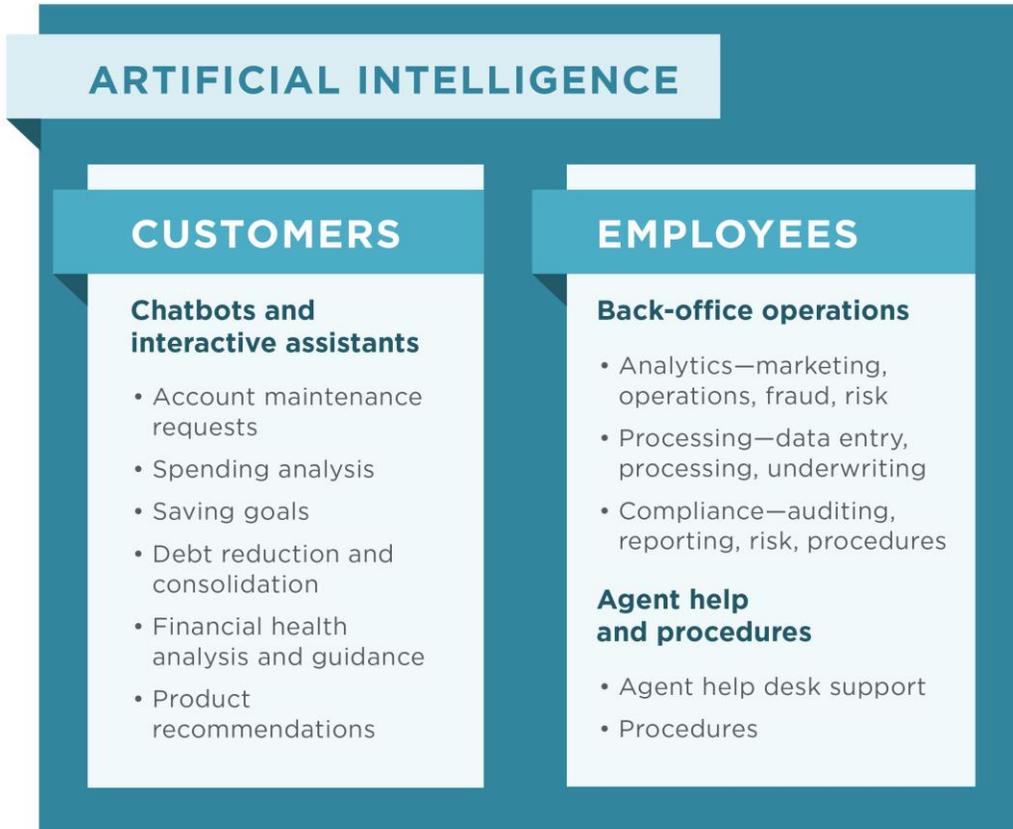
Source: Aite Group

1. See Aite Group's report *Machine Learning for Fraud Mitigation: The Substance Behind the Buzz*, April 2017.
2. See Aite Group's report *Top 10 Trends in Retail Banking, 2018: Accelerating Evolution*, January 2018.
3. See Aite Group's report *Chatbots and Interactive Assistants: Building Engaging Digital Experiences*, October 2017.

## AI BENEFITS FOR CUSTOMER AND EMPLOYEE

A technology with such broad impacts is rare. Usually, when a new technology is introduced, it is thought of in silos—meaning FIs only consider the technology’s immediate benefits for a specific use case and/or channel. It is not until later that technology is considered to help solve other business challenges. AI is one technology that has broad benefits to the customer and the employee (Figure 1).

**Figure 1: Ways Artificial Intelligence Can Transform the Customer and Employee Experience**



Source: Aite Group

## COMMON AI USE CASES

Table B shows the different stages of the customer life cycle and the different use cases for which AI improves the customer or employee experience.

**Table B: Opportunities to Use AI During the Customer Life Cycle**

Life cycle stage	Use cases for customer experience	Use cases for employee experience
<b>Win the customer</b>	<p>Use account information to predict when customers may experience a life event that has financial impact (e.g., sending a child to college or buying a car).</p> <p>Use account information to recommend products to customers based on how they spend money, where they spend money, and their overall financial goals, such as buying a home or saving for retirement.</p> <p>Offer customers product features that are aligned with how customers use their accounts (e.g., offer a credit card reward program based on how and where a customer spends money).</p>	<p>Deploy more advanced marketing analytics strategies that move from mass marketing to personalized offers.</p> <p>Reduce risk by identifying application fraud.</p> <p>Automate the Know Your Customer process during onboarding.</p>
<b>Engage in finances</b>	<p>Help customers identify ways to save for their goals and provide guidance on how to invest or use their money once they reach their goals.</p> <p>Use account transaction information to predict future cash flow and provide insight on how much money is safe to spend.</p> <p>Predict when account maintenance activities will need to be performed (e.g., travel notification so credit card transactions are not stopped while a customer is abroad).</p> <p>Remind customers of upcoming financial activities (e.g., payment reminders).</p>	<p>Automate the processing of service requests, such as automatically setting travel notifications to reduce incoming calls and sending notifications when payments have not been made to help a customer make payments on time and avoid collection calls.</p> <p>Analyze a customer's usual behavior patterns as well as the context of the transaction to authenticate the customer.</p> <p>Deploy RPA robots or "bots" that sit on the desktop and act as assistants to employees by quickly gathering customer data from multiple internal and external sources and across different systems.</p> <p>Identify any customer action that breaks from historical and/or normal behavior and that may indicate fraudulent activity (e.g., a profile change).</p>

Life cycle stage	Use cases for customer experience	Use cases for employee experience
<b>Earn trust</b>	<p>Identify and protect customers from fraudulent activity.</p> <p>Predict the next best action for the customer for either a new product or a service.</p> <p>Review customers' creditworthiness and offer guidance on how to build or rebuild their credit ratings.</p> <p>Analyze customers' accounts and payments to identify ways to restructure debt and improve cash flow and credit scores.</p>	<p>Reduce fraud risk, ensure AML/Know Your Customer compliance, and audit business processes for compliance adherence.</p> <p>Improve fraud detection and reduce false positives (i.e., when potential fraud is detected but the transaction is a legitimate one initiated by the customer).</p>
<b>Build loyalty</b>	<p>Understand customer sentiment and use such information to identify when customers are likely to leave the FI or end the relationship and direct them to a retention team when they next call in.</p> <p>Help customers understand how account features can save them time and money (e.g., overdraft protection and mobile deposit).</p>	<p>Deploy a bot that helps provide guidance to more junior-level employees to stop them from calling a help desk or seeking advice from a more experienced employee.</p>

Source: Aite Group

## RESULTS FROM EARLY ADOPTERS

Although an FI can use AI in many areas, one that is getting the most traction is fraud. This is because the process is rife with inefficiency.

AI has already been applied to a variety of use cases with positive, quantifiable results, as described in Table C. However, many use cases do not yet have quantifiable results that FIs are willing to share, since the technology use is still emerging.

**Table C: Use Cases and Proof Points**

Use case	Proof point
<b>Chatbots and interactive assistants</b>	American Express' Facebook Messenger chatbot provides account alerts for recent transactions and purchase protection, delivers information on card benefits, answers questions about account and reward balances, and helps consumers choose new cards.
	Bank of America's mobile-banking interactive assistant, erica, makes payments, checks balances, saves money, pays debt, monitors FICO scores, and provides access to educational videos and other content.
	USAA's mobile-banking interactive assistant handles more than 120 commands, including activating cards, changing PINs, setting travel notifications, and reporting lost or stolen cards.
<b>Payment card transaction analysis</b>	A large U.K. issuer implemented an ML analytics engine as an overlay to its incumbent transactional analytics solution and saw a 70% reduction in false positives.
<b>Marketing analytics</b>	Synchrony Financial uses sentiment analysis from customer reviews in several ways—to identify opportunities to enhance the user experience, to provide additional product features, and to communicate card benefits more clearly. <sup>4</sup>
	BBVA Compass is currently working to proactively send alerts to customers to tell them how they can get more credit card reward points. <sup>5</sup>
	HSBC is using AI software to predict the types of reward offers card customers prefer. The number of offers selected by AI and emailed to customers was opened 40% higher than the group that did not get an AI-selected offer, and 70% of email recipients who made selections chose rewards in the AI-recommended categories. <sup>6</sup>

4. See Aite Group's report *Predictive Analytics: The Path to Competitive Differentiation*, February 2017.

5. Charles Keenan, "Big Data and Predictive Analytics: A Big Deal, Indeed," ABA Banking Journal, November 2015, accessed November 8, 2016, <http://bankingjournal.aba.com/2015/11/big-data-and-predictive-analytics-a-big-deal-indeed-2/>.

6. Penny Crosman "Cash or Gift Card? (Never Mind—Our AI Already Knows)," American Banker, March 26, 2018, accessed March 26, 2018, <https://www.americanbanker.com/news/cash-or-gift-card-never-mind-hsbc-ai-already-knows>.

Use case	Proof point
<b>Merchant acquiring</b>	A large acquirer in Europe reduced its false positives by 84% while increasing fraud detection by 62% using ML analytics.
<b>Account opening</b>	A large FI detected 30% more application fraud through ML analytics at the time of account opening.

Source: Aite Group

FIs are large, complex, and often highly siloed organizations. Each business unit has its discrete objectives for revenue and profitability. This siloed approach is “legacy thinking,” and this myopic approach to new technology allows individual business units to pursue parallel and often redundant paths.

It’s not realistic to expect the path to AI to be any different. There is so much potential with the various applications under the AI umbrella that there will be multiple use cases and proofs of concept operating simultaneously within the organization. However, leading-edge FIs are creating structures to share best practices and lessons learned, and to identify potential synergies around AI projects. This move away from legacy thinking, which is centered on making decisions in silos, and toward a more organizational view of technology can help avoid project overlap and duplication and ensures effective use of resources.

## THE ROLE OF HUMANS

As FIs consider what to automate with AI and the role humans will play, they should think about these processes:

- **Process mapping:** AI models do best when they have a broad set of data inputs from which they can identify subtle patterns from seemingly disparate clues. For example, cross-channel fraud is a problem that has plagued FIs for years, in no small part because they were blind to just how big the problem was due to siloed data and analytical processes. ML provides visibility into the magnitude of the problem (it's big) as well as the means to detect the fraud as it happens. ML models take the approach of understanding good customer behavior better, then identifying outliers and anomalies.
- **Data labeling and classification:** As with all analytics, the old adage "garbage in, garbage out" holds true. While low-cost data storage provides an unprecedented number of inputs to AI solutions, the sad reality is that most of the time the data comes from disparate databases with little in the way of common classification. The outset of any AI initiative requires data cleansing and labeling to ensure that the inputs to the system are sound and well-understood.
- **Review and feedback loop:** Depending on the use case, some applications of the technology will directly interdict (stop or intervene) a transaction in real time, while others will send alerts to a manual review queue for evaluation. In either case, it's important to have a process in place to effectively tag false positives and false negatives and to use that data to optimize the model.
- **Digital customer experience:** When FIs choose a chatbot or an interactive assistant, FIs will still need to determine when to transfer an interaction to another channel. Consumers may get frustrated if they are stuck in a loop with no answers or the wrong answer. This may diminish the trust the consumer has in the bank's ability to address questions or provide real-time help.
- **Manual intervention:** FIs will need to determine when a human should intervene in the process. Using ML for marketing activities may require little human intervention, but humans may need to validate the models at times to make sure they do not introduce bias or violate compliance rules, such as fair lending.

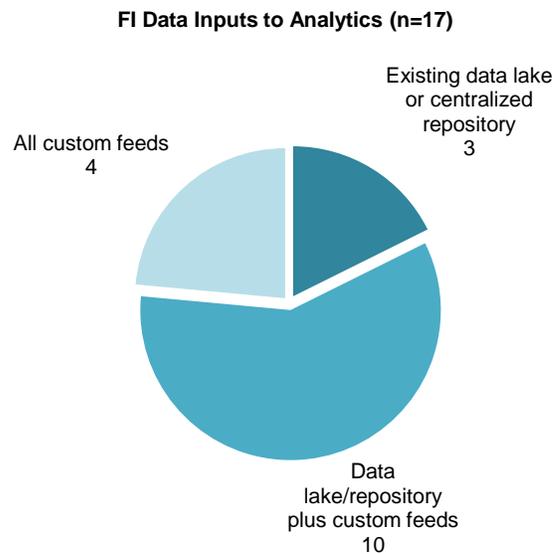
## AI IMPLEMENTATION CHALLENGES

A little over one-third of banking executive respondents expect to have an AI solution in place within 18 months. While this seems promising, some executives may find they are not ready to implement a solution. Two of the challenges FIs will encounter when they implement AI solutions are preparing data and finding talent.

### DATA PREPARATION

The vast amount of data now available to inform AI is a key factor in success. Corraling that data can be a challenge, however. Of the large North American FIs surveyed that are using some form of ML as part of their fraud-detection process, three are tapping into an existing data lake or central data repository, 10 are using a combination of an enterprise data lake and custom feeds, and four are feeding their analytics entirely with custom feeds (Figure 2).

**Figure 2: Data Inputs**



*Source: Aite Group interviews with 28 executives at 20 North American FIs, August and September 2017*

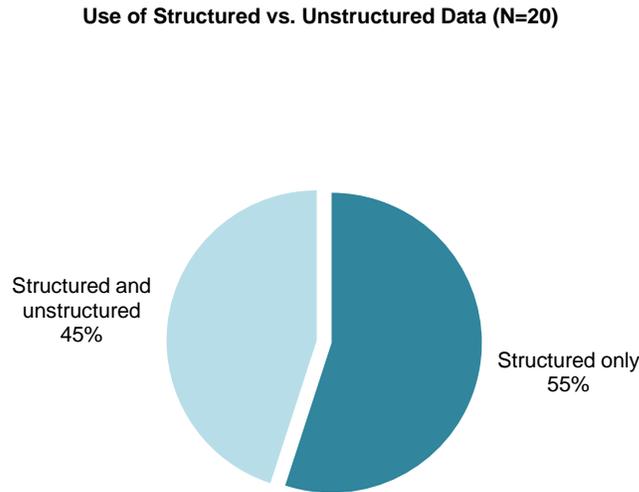
### STRUCTURED VS. UNSTRUCTURED DATA

Many AI-based systems are capable of ingesting and processing both structured and unstructured data sources. Structured data is that which is available in a clearly defined database, whereas unstructured data is that which is extracted from free-form documents and data streams (e.g., a PDF invoice supporting a trade finance transaction or recorded calls in contact centers). Fifty-five percent of the FIs interviewed are only using structured data today for their fraud-prevention installations, while 45% are using both structured and unstructured data (Figure 3). The vast majority of FI executives indicate that incorporating more unstructured data is one of the goals of their data journey.

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**Figure 3: The Use of Structured vs. Unstructured Data**

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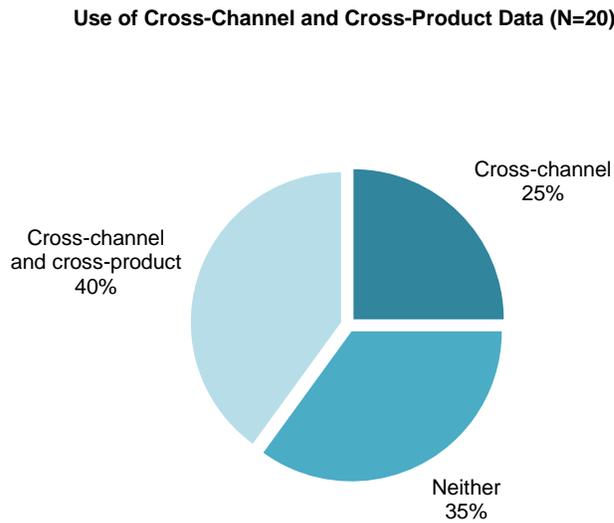
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*Source: Aite Group interviews with 28 executives at 20 North American FIs, August and September 2017*

**CROSS-CHANNEL AND CROSS-PRODUCT DATA**

Cross-channel and cross-product data can be incredibly helpful in informing AI-based systems. However, it can be very difficult to obtain this data, given the different data structures, update frequencies, and challenges associated with internal politics and project prioritization.

Forty percent of large U.S. FIs interviewed have some level of cross-channel and cross-product data informing their fraud analytics today; 25% bring in cross-channel data, and 35% do neither (Figure 4). Device data attributes and contact center data are some of the key cross-channel data that FIs are bringing together today, or that are in some phase of implementation. The vast majority of FI executives interviewed indicate that gathering and optimizing data inputs will be an ongoing process for quite some time.

**Figure 4: The Use of Cross-Channel and Cross-Product Data**

*Source: Aite Group interviews with 28 executives at 20 North American FIs, August and September 2017*

## FINDING TALENT

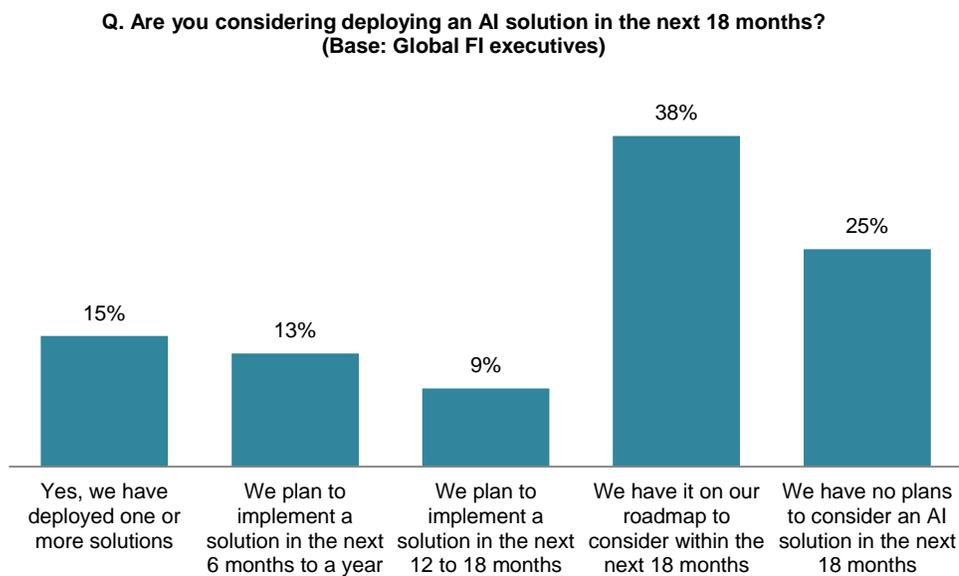
While most of the FIs interviewed plan to incrementally add talent to their teams, hiring is a challenge. The data science skill set is in high demand, and executives say finding the right talent is difficult. One FI executive is concerned that universities are churning out data scientists with skill sets that do not include experience with programming languages or databases, such as Python and NoSQL, which are critical for AI projects. While the largest FIs (those with more than US\$500 billion in assets) are building substantial in-house teams, many of the smaller FIs are looking to their vendor partners to provide these resources.

FIs are all at very different stages of their AI journeys. That makes it hard to quantify plans to hire talent, as hiring plans largely depend on the investment being made in AI and the types of use cases the FI is taking on. In interviews with FI executives, the pattern that we see is that many large FIs have plans to grow their staff to match their AI investment. Smaller FIs, in most cases, are a little more conservative with their approach to bringing in talent or to take on AI investments and tend to rely on their main technology solution provider for expertise. In some cases, we do see smaller FIs that are well-versed in AI skills and have plans to deploy AI in a number of areas.

## LARGE FINANCIAL INSTITUTIONS ARE DRIVING AI INVESTMENT

According to the December 2017 issue of Digital Banking Report, 15% of the financial services executives in digital banking or marketing roles have deployed one or more AI solutions, 13% plan to implement a solution in the next six months to a year, and 9% plan to implement a solution within 12 to 18 months. If executives put action behind their words and deliver a solution according to plan, a little over one-third of survey respondents will have an AI solution in place within 18 months (Figure 5).<sup>7</sup>

**Figure 5: AI Solution Deployment**

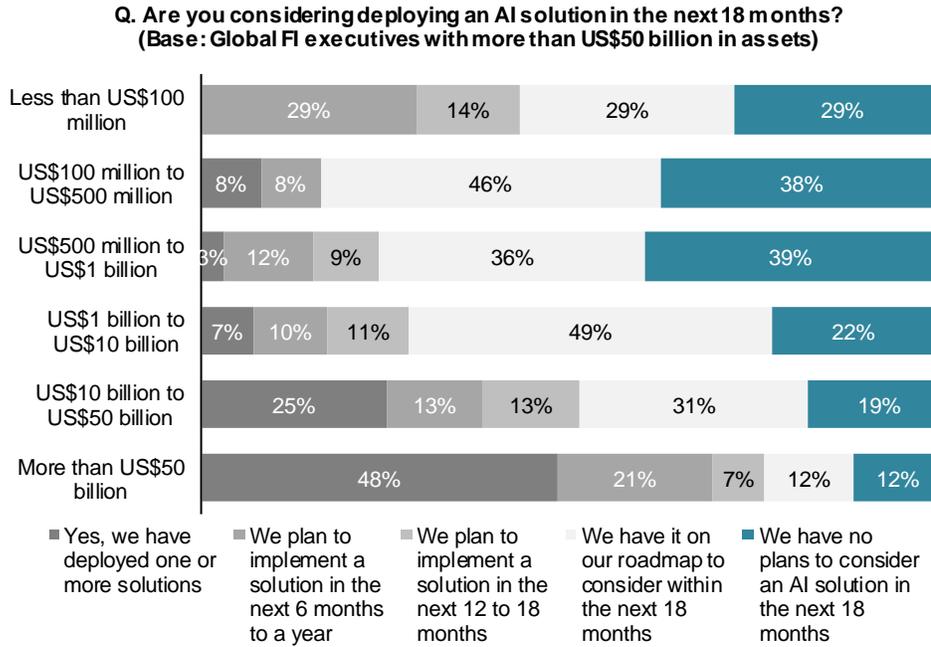


Source: 2017 Digital Banking Report, Aite Group

When we look at the size of organizations deploying AI projects, the picture becomes clearer. Forty-eight percent of executives that work at an FI with more than US\$50 billion in assets indicate they have deployed one or more AI solutions. Another 28% indicate they plan to have a solution implemented within 18 months. That means that within 18 months over three-quarters of FIs with more than US\$50 billion in assets will have implemented an AI solution. And roughly half of FIs with US\$10 billion to US\$50 billion have planned to implement a solution within 18 months, showing that most of the investment in AI is coming from the larger financial institutions (Figure 6).

7. "2017 Retail Banking Trends and Predictions," Digital Banking Report, December 2016, accessed September 22, 2017, <https://www.digitalbankingreport.com/dbr/dbr245/>.

**Figure 6: AI Solution Deployment by Size of FI**

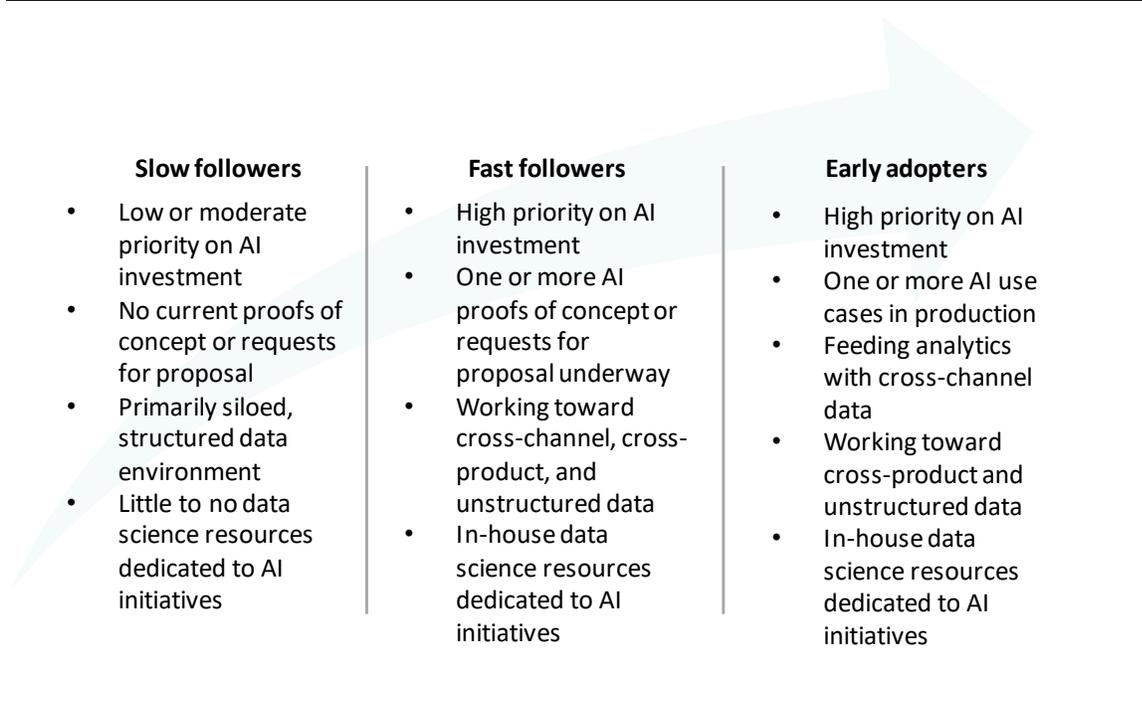


Source: 2017 Digital Banking Report, Aite Group

## SUCCESSFUL AI SOLUTIONS REQUIRE THE RETIREMENT OF LEGACY THINKING

The FIs that Aite Group has interviewed are at many different stages in the AI journey. As with many emerging technology trends, there are early adopters, fast followers, and slow followers of AI (Figure 7). Some FIs have made substantial investments already and plan to continue this pace, while others haven't even begun. With AI, however, the stakes are high for FIs that delay. Early adopters are already seeing significant benefits in terms of detecting fraud, improving operational efficiency, enabling new transactional activity, and removing friction from the customer experience. The longer the slow followers delay, the greater the customer experience divide between them and early adopters.

**Figure 7: AI Maturity Model**



Source: Aite Group

AI will have a profound impact on every level of the organization. But most FIs are falling victim to a legacy mindset and allowing each business unit to make technology decisions based on banking silos—by product and by channel. Whether the use case is a customer-facing chatbot or back-office RPA designed to automate repetitive tasks, such efforts will have limited success if the FI does not take a strategic and holistic approach. Successful AI initiatives share these key characteristics:

- **Early investment in data hygiene:** AI is only as good as its inputs. FIs that have a common data strategy across the organization will quickly roll out new AI initiatives across their organizations.

- **Effective process mapping:** Too often, FIs are automating processes without a clear understanding of the processes' dependence on existing manual processes or other business units and channels. Numerous anecdotes have emerged about this derailing automation efforts and leading to not only wasted IT time but also additional effort to clean up the issue.
- **Chatbots and interactive assistants will need to create a consistent customer experience:** Many FIs are investing in deploying a conversational touch point and deciding to test and learn in one platform—messaging app, voice assistant, or mobile-banking assistant—before the others. While it's good to test and learn, it will be important that FIs do not fall into legacy thinking and adopt a siloed approach by selecting a different platform for each conversational touch point. For FIs to deliver a consistent customer experience as their strategy evolves, they must select one platform for the business.

For those FIs that are abiding by these guiding principles, AI-based initiatives are creating a compelling competitive advantage in the form of a better customer experience and lower back-office costs.

## NEXT STEPS

Whether they are deploying ML, RPA, NLP, or any other AI technique, what should FIs consider when they get started?

- **Determine what use cases to implement.** AI is still a nascent technology. That means that FIs are mostly focused on implementing the “must have” versus the “nice to have.” FIs have been focused on using AI to help identify AML and combat fraud because these are low-hanging fruit with significant impacts on the organization’s efficiency and profitability.
- **Focus on improving the customer experience.** AI has shown to effectively help improve the customer experience in material ways. Many FIs are working on improving the customer experience in areas such as better identification of false positive situations to avoid inconveniencing a customer.
- **Determine whether to build or buy.** While a handful of the largest organizations can build their own in-house data analytics function, the vast majority do not have the budget or the political support for this. Even those businesses with their own in-house analytics teams often look to external vendors to speed time to market and bring in expertise to help them with specific use cases.
- **Feed the beast.** The vast amount of data now available to inform AI analytics is a key reason for its success. Among the executives Aite Group has interviewed, there was a clear consensus that data will make or break the success of an AI initiative. Make sure your organization has the ability to (1) gather the wide range and quantity of data inputs needed, (2) tag them appropriately, and (3) provide a feedback loop to help hone the solution.
- **Understand when to transfer an interaction to a live person.** A chatbot or interactive assistant is not going to be able to respond to every customer question.
- **Determine what AI talent is needed.** Assess your internal team and decide if you have the right skill set to be able to tackle the many challenges you will face implementing and maintaining AI solutions. FIs should start thinking about what resources they need to implement and maintain AI solutions and whether third-party services are required.

## ABOUT AITE GROUP

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