



Artificial intelligence: The weapon of choice in banks' fight for survival

Padmaavathy PA

Assistant Professor, Department of Management, Karpagam Academy of Higher Education Deemed to be University
Coimbatore, Tamil Nadu, India

Abstract

Artificial intelligence is a reality today and it is impacting our lives faster than we can imagine. It is already present everywhere, from Siri in your phone to the Netflix recommendations that you receive on your smart TV. The revolution brought by Artificial intelligence has been the biggest in some time. There is no denying that it has already become a crucial and integral part of our life. In recent years, if Artificial Intelligence has impacted one industry more than any other, it's the Banking industry. For organizations working in the banking industry, it has become increasingly crucial to keep up with competition, and increase their standing as an innovative company. AI has become something of a buzzword, not just in banking but for many industries. But behind the hype lies the potential for genuine transformation in the way the banking industry-and indeed, the world-functions. And with specialised hardware being equipped with ever-increasing processing power to enable more robust AI systems, as well as vastly improved infrastructure to mine and feed data to such systems for even greater capabilities, the banking industry is now releasing the extent to which machine intelligence can positively redefine how it operates. Of course, several questions remain, such as how exactly banks can co-ordinate AI's awesome power with the customer's need for human interaction when needed. Nevertheless, some dramatic changes now loom on the horizon for banking. In conclusion, it is evident that AI is here to stay, and is impacting a large number of industries, Banking is an early adopter of this trend. This trend is likely to grow exponentially in the future. Companies that embrace this trend are likely to be winners over the next 10 years.

Keywords: technology, banks, robots

Introduction

Artificial intelligence is the blend of three advanced technologies – machine learning, natural language processing and cognitive computing. The concept of Artificial Intelligence is to simulate the intelligence of humans into artificial machines with the help of sophisticated machine learning and natural language processing algorithms. The prime motive for the idea of transferring the intelligence from humans to machines is to overcome the very barrier of human intelligence: scalability. Artificial intelligence, mobile banking, new forms of security authentication and the Internet of Things will help banks modernize their technology.

Banking business and technology leaders agree that Artificial Intelligence (AI) is among the key trends that will reshape the industry in 2020.

Advent of AI banking in India

According to Accenture's recent *Accenture Banking Technology Vision 2018* report, 83% of Indian bankers believe that AI will work alongside humans in the next two years - a higher than the global average of 79%. "93% bankers in India said they increasingly use data to drive critical and automated decision-making. More partner-supplied customer data means a higher degree of responsibility for banks. Yet, 77% Indian bankers agree that most firms are not prepared to confront impending waves of corrupted insights from falsified data," said the report.

AI is not new to India. Research institutions and universities

have been working with various AI technologies for decades, and especially in the area of social transformation. With enabling technologies becoming a lot more accessible and inexpensive, AI is now becoming mainstream, with large enterprises and start-ups looking at different opportunities. The adoption of AI has the potential to add nearly \$1 trillion to the Indian economy in 2035. AI adoption is still in its nascent stages, and a lot more needs to be done to realise its full potential.

Application of AI and ML (machine learning) to different functions within the banking industry has enabled them to offer a far more personalised and efficient customer service. By achieving that, banks have also been able to gain better insights into their customers' preference and expectations from the bank. Accordingly, automation of back-end workflows has shown better outcomes. According to various industry reports, more than 36% of large financial institutions are already investing in such technologies, and close to 70% are planning to in the near future.

Not just customer support

State Bank of India, the largest bank in India, last year conducted "Code for Bank" hackathon to encourage developers to build solutions leveraging futuristic technologies such as AI and Blockchain into the banking sector. Private banks like HDFC Bank and ICICI Bank have already introduced chat-bots for customers service. Some have even gone ahead with placing robots for customers' service.

Last year, Canara Bank installed Mitra and Candi robots at some of its offices.

Payment companies are using AI to offer personalised payment experience to consumers. By applying AI and analyzing past payment patterns, payment systems can prompt the preferred payment instrument which best suits a purchase at the time of checkout. Say a consumer avails EMI option frequently for his big-ticket purchases, then the best EMI option is made available to the consumer at the time of checkout. Such personalised consumer experiences drive up consumer spending and creates stickiness to the product consumers are using.

Common uses of AI in banks

Fraud Detection

Anomaly detection can be used to increase the accuracy of credit card fraud detection and anti-money laundering.

Customer Support and Helpdesk

Humanoid Chatbot interfaces can be used to increase efficiency and reduce cost for customer interactions.

Risk Management

Tailored products can be offered to clients by looking at historical data, doing risk analysis, and eliminating human errors from hand-crafted models.

Security

Suspicious behaviour, logs analysis, and spurious emails can be tracked down to prevent and possibly predict security breaches.

Digitization and automation in back-office processing

Capturing documents data using OCR and then using machine learning/AI to generate insights from the text data can greatly cut down back-office processing times.

Wealth management for masses

Personalized portfolios can be managed by Bot Advisors for clients by taking into account lifestyle, appetite for risk, expected returns on investment, etc.

ATMs

Image/face recognition using real-time camera images and advanced AI techniques such as deep learning can be used at ATMs to detect and prevent frauds/crimes.

Not without challenges

A wide implementation of a high-end technology like AI in India is not going to be without challenges. From the lack of a credible and quality data to India's diverse language set, experts believe a number of challenges exist for the Indian banking sector using AI.

A key challenge is the availability of the right data. Data is the lifeblood of AI, and any vulnerability arising from unverified information is a serious concern for businesses. Imagine for example, the risks that could arise from KYC compliance AI systems if the data sources are incorrect. Or consider the efficacy of a fraud detection AI system without the right kind of data. Structured mechanisms for collecting, validating,

standardizing, correlating, archiving and distributing AI relevant data is crucial.

India has 150+ languages with sizable spoken population. Applications which use speech to text or text to speech rely on natural language processing (NLP) libraries and techniques. Banks can use the existing technologies to start with to support some major Indian languages, but in order to effectively reach out to wider population in India, much more progress is required on NLP front. Data access and data privacy is a central aspect of any AI work banks do. These aspects will be of paramount importance with introduction of regulations in Europe such as GDPR (General Data Protection Regulation). GDPR regulation is currently applicable to European citizens, but India and other countries have their own data privacy regulations.

Banks in India will have to build AI systems with GDPR and similar privacy regulations in mind. Experts also have also stressed the need for more skilled engineers to drive the segment. The biggest challenge is the scarcity of trained human resources; the existing workforce is not familiar with latest tools and applications. Secondly, the AI technology is a big threat to redundant employees in the banking sector. The mass adoption of AI may cause a grave unemployment problem in the sector.

One of the important challenges that is faced by Industry and not just banks in India is unavailability of people with right data science skills. With only small number of good data scientists available to do AI work, the industry needs to work with universities in India to develop skilled data scientists as well as develop in-house training programs to train employees on data science skills. Also identification of right use cases for AI implementation with the help of domain experts and data scientists can help banks in successful implementation of AI technologies for banking functions.

Banking consumers are demanding more individualized experiences as they become increasingly accepting of new technologies. In the era where tech giants like Google, Apple, Facebook and Amazon dominate, people have become accustomed to seeing personalized offers built on data that they voluntarily provide, and now it's a common expectation. A few leading banks are expanding on the artificial intelligence system used by voice-powered devices like the Amazon Echo, Google Home and Apple's Siri to improve service and enhance the customer experience. For instance, Barclays Bank is developing an AI system to let customers talk to a device and get information they need for vital transactions. And the Swiss Bank UBS recently announced that it is using robots on the trading floor to boost traders' performance.

Other banks are looking at using AI to help customers make investment choices in a modeling approach similar to what UBS is doing for its traders. These special kinds of machine learning models are developed to ascribe human intuition, experience and intelligence - untethered from the actual humans who have traditionally managed assets - to digital platforms that can be placed directly in the consumer's hands. Behind these developments are machine learning algorithms that model the characteristics of consumer behaviors - for example, incomes and typical investments which can then be used to predict investment preferences and patterns of choice.

The machine learning algorithm runs in the background while another engine handling “speech-to-text” gives advice.

While these algorithms can learn, the “machine” element does not make them self-sufficient and self-sustaining. They must be fed the right data to the right models at the right intervals, typically by real live human beings - “data scientists” who are now playing pivotal roles in the digital transformation strategies of traditional financial institutions.

One area in which banks are arguably adopting AI even faster is the management of unstructured data from customers - emails, news articles, legal documents and recorded telephone conversations. Analyzing this data starts with *managing* the data, *before* applying analytics. Only after that can AI be used to process information intelligently.

For example, JPMorgan Chase recently introduced a “Contract Intelligence” (COiN) platform designed to “analyze legal documents and extract important data points and clauses.” A manual review of 12,000 annual commercial credit agreements normally requires approximately 360,000 hours. But results from an initial implementation of this machine learning technology showed that COiN could review the same number of agreements in seconds, demonstrating the tremendous power of AI. With the potential to slash costs, reduce manpower and save thousands of hours, it should be no surprise that JPMorgan Chase is now exploring a myriad of other ways it can implement this potent new tool.

Smarter banks with AI

AI has potential to make banks exponentially smarter. “Smarter” in this case means delivering better customer insights and intelligence, and thus a better customer experience - something most in the banking industry now believe is the key to differentiation, growth and increased

profits.

For example, by studying and learning the behaviors of market participants (any market, not just the equities markets), AI could be used to learn how those markets behave, enabling better risk assessments. In the real world, an AI system that has learned the behavior of a particular trader and its effects on performance over time may help to prevent that trader from making unsuccessful decisions based on “gut feeling.” Modeling human behaviors - complex, emotional and influenced by a wide range of inputs - can also help bankers predict customers’ creditworthiness better than a credit score.

AI can also improve banks’ customer service. This can happen in several ways. AI can aggregate all information about a customer, so that it “knows” the customer, and can tailor its interactions. It is also conceivable that Apple’s face recognition software could play a role. The bank branch of the future may “recognize” me as I walk in, so that the consultant who greets me already knows about me.

Since the global economic crisis in 2008 and regulations from Basel to Sarbanes-Oxley, cost pressures have been accumulating on banks. It has also created enormous potential for disruption. Now the question is whether the worm will turn, or if fintechs will become market leaders. Today, fintechs and banks are largely complementary to one another, but that could change... quickly. It remains to be seen how fast traditional institutions will realize the opportunities of digitalization — that is, not simply *replacing* analog processes with digital, but *discovering completely new* potential in data analytics and AI.

The biggest challenge is probably cultural. AI needs a “fail fast” approach, but banks still find it hard to accept failure. With AI, the financial world now has a way to give employees the freedom to start this cultural change.

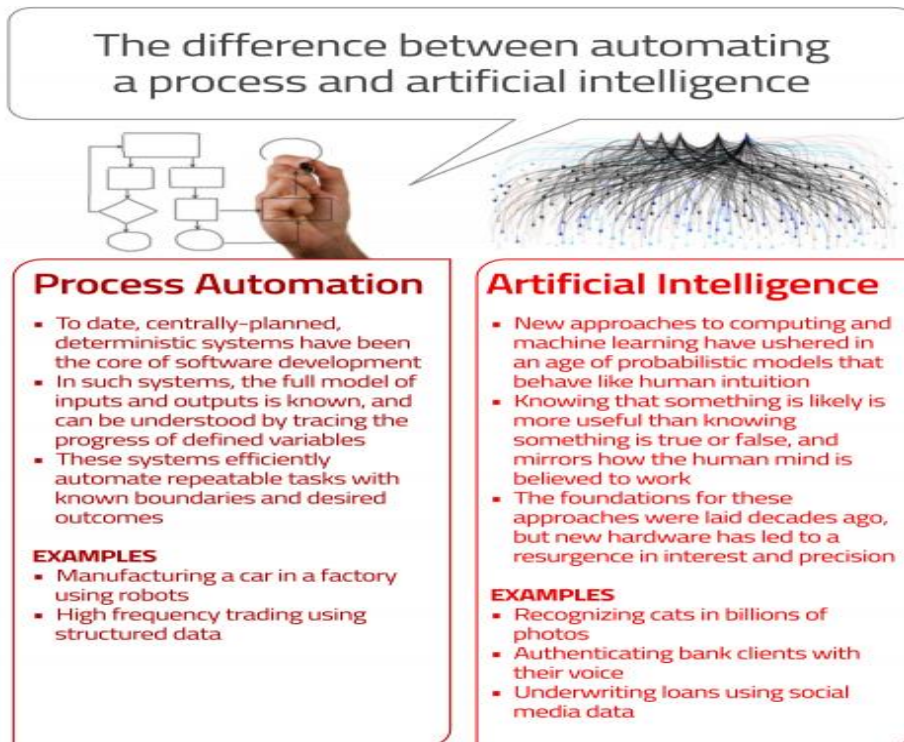


Fig 1: How the banks want to use AI?

1. Chatbots and virtual personal assistants



Fig 2

What does this mean?

Banks are using chatbots and voice bots to interact with customers and solve problems before any human staff get involved.

The Technology behind IT

Natural language processing and generation will make it increasingly difficult for customers to tell whether they are talking to a human or an AI interface. Voice recognition and facial recognition could be used instead of passwords to ensure security.

2. Profiling customers



Fig 3

What Does This Mean? Banks want to offer personalised communications and decisions based on detailed profiles of each customer. They could also use customer profiling and algorithmic sorting to assess risks and precision-target offers.

The technology behind IT

AI could use the vast mass of unstructured data on each person to profile customers. Machine learning - computers which can learn from data - could then be used to analyse behaviour patterns. Algorithms could also automate increasing numbers of decisions. Language analysis will also be applied to word choice and syntax to predict decisions. This technology is already being used by some fund managers to assess the word choices of chief executives and work out what that means for future company performance.

3. Streamlining processes

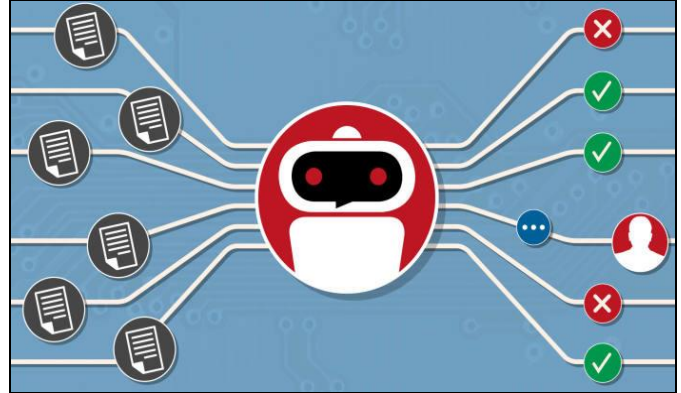


Fig 4

What does this mean?

The banks want 'low-value processes' to be handled by AI. This would mean documents being scanned and parsed by computers. Some decision-making could be made by AIs operating with complete knowledge of the regulations and laws in each territory.

The technology behind it

Image recognition and machine learning could be combined to scan masses of documents, and take actions based on the laws and regulations which apply. Algorithms could then be used to decide which cases should be passed to a human decision maker.

4. Spotting patterns



Fig 5

What Does This Mean?

AI could spot the anomalies or patterns in transactions which might indicate fraud and money-laundering. Face and voice recognition could also flag up fraudsters who are already in the system. Data could be shifted to find trading patterns that indicate risks or investment opportunities.

The technology behind IT

Machine learning enables AI to parse the masses of unstructured data to separate the signal from the noise in markets, and it can self-correct. Complex image recognition can be used to identify people and objects.

The cost: Job cuts, spending and deploying Ai

The FT surveyed 30 of the world’s biggest banks about their approach to AI. Eighteen provided detailed answers to at least five of the 14 questions, another five gave descriptive responses on their AI efforts, the rest declined to participate.

The results show that

Front office is king: 17 of the 18 banks are already using AI in front office for everything from Citi’s Facebook messenger chatbot to UBS’s use of Amazon’s virtual assistant Alexa for customer service. Front office is also where banks see the biggest potential for AI-related savings.

Broad is best: Eight of the 18 banks are using AI in front office, middle office, back office and data analytics. The other 10 are using it in three of the four areas.

Resources vary widely: Nine banks provided details on staffing their AI efforts. One European bank, which asked to remain anonymous, employs between 500 and 800 people. Nordea said it had 25. Six banks gave details of AI spending; the sums ranged from €5m to €15m, with one institution planning to increase spending from below \$3m to \$50m a year.

Conservative on job cuts: Seven banks gave estimates of possible AI-related job losses. Six said it would be below 20 per cent. **Seniors accountable:** Five of the 18 banks have management board members directly responsible for AI. **Partnerships in vogue:** Eight of the 18 banks are involved in joint ventures, four have made investments in AI-related companies.

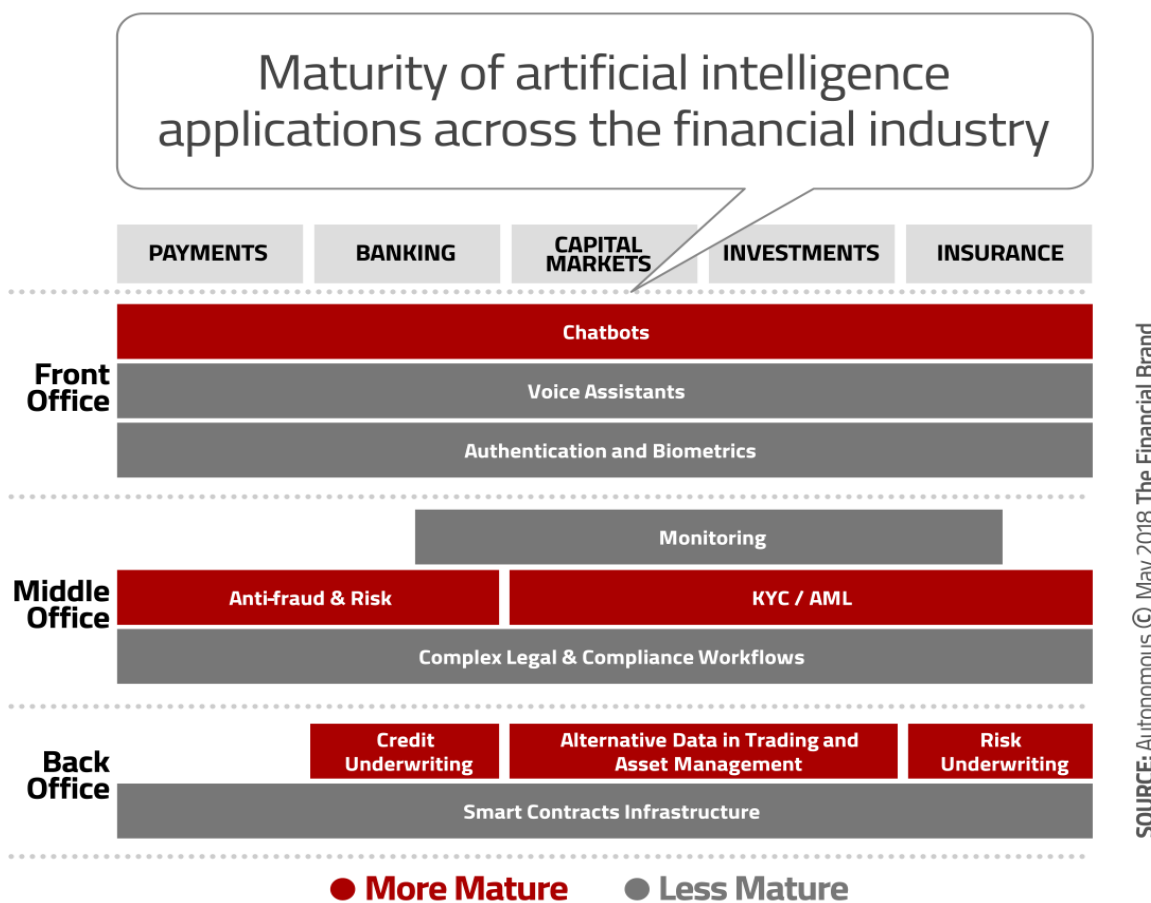


Fig 6

AI technologies such as machine learning, deep learning, predictive/prescriptive analytics, virtual agents and natural language understanding technologies (e.g. Siri, Alexa, Google home) are gaining popularity among progressive banks. Financial Services is data intensive and therefore a great candidate for AI automation. AI technologies offers banks an opportunity to reinvent banking processes and gain unprecedented advantages.

What Lies in the future?

Undoubtedly, AI will drive the banking and financial services markets of the future. This will only be possible if the industry

is able to manage the security risk of AI systems. A report by several US and UK experts on the malicious use of AI states that a range of security threats including cyber, political, and physical arise with the growth in the capabilities and reach of AI. A proactive effort will be needed to stay ahead of the attackers, they feel. Moreover, the success of AI will boil down to customer impact above anything else. But if AI cannot achieve that and instead confuses the user with multiple pre-laid steps, then there’s a problem.

Digitalization, until now, has impacted groups of people in different parts of the organization. Applied intelligence—our term for using a set of AI tools in combination with human

ingenuity, across the enterprise, to solve complex challenges, develop new products, and break into and create new markets-will be much more pervasive. It will require dedicated leadership at the highest level and a cross-enterprise strategy with long-term budgeting. It also demands a workforce significantly different than that which is found in most banks today.

The change will take a concerted, thoughtful and ongoing effort. The research points to three key actions

1. Reimagine work
2. Pivot the workforce
3. Scale up 'new skilling'

To benefit from the immense potential of AI, banks cannot simply apply it in an incremental, piecemeal fashion. Executives recognize that it will rapidly transform their organization and their industry. It follows that they need an enterprise strategy and enterprise-level leadership dedicated to AI. They also need a different type of workforce: one that is capable of implementing AI, and of working in tandem with intelligent solutions to develop new sources of value. Banks that invest in AI and human-machine collaboration at the same rate as top-performing businesses could boost their revenue by an average 34 percent and their employment by 14 percent by 2022.

Conclusion

It's an exciting time for financial services. A veritable smorgasbord of new, interrelated technologies are brewing up a perfect storm of disruption in the industry, including blockchain, data science, cloud computing and biometrics. Arguably, however, it is the significant advancement being achieved in the world of artificial intelligence (AI) that is having the most transformational impact on banking. In turn, AI is expected to permanently change the industry in profound ways during the coming months and years.

Few business sectors are currently more focused on developing AI for its own betterment than banking, as financial institutions seek to gain a competitive edge on their peers by implementing the technology to achieve improvements in speed, cost, accuracy and efficiency, as well as meet customer needs in an altogether more comprehensive manner. Much of the anticipation surrounds the ability of machines to replicate, and often exceed, what humans are able to do in banking. By collecting and utilising data to identify a whole host of patterns, moreover, those machines can become more adept at predicting activity that will ultimately make banks more efficient, from the front office to the back end.

References

1. Pau LF. (Ed.), Artificial intelligence in economics and management, North Holland, Amsterdam, 1986.
2. Mariani F. CRES, Proc. AICA Annual congress (Italy), 1988.
3. Pinson S. SEAC, in: Economics and AI, J. Roos (Ed.), Pergamon Press, 1986, pp53-158.
4. Mays E. Organizing knowledge in a complex financial domain, IEEE Expert. d1987; 2(3):61-70.
5. <https://www.analyticsvidhya.com/blog/2017/04/5-ai-appl>

6. https://www.rbi.org.in/Scripts/BS_PressReleasedisplay.aspx?prid=34754
7. https://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=35010
8. <http://economictimes.indiatimes.com/news/politics-and-nation/over-9-3-crore-pans-linked-with-aadhaar/articleshow/60045489.cms>
9. <https://www2.deloitte.com/in/en/pages/financial-services/articles/banking-on-the-future.html>
10. https://en.wikipedia.org/wiki/Three_Laws_of_Robotics.