

ISM 6124 Advanced Systems and Analysis Design

Hot Topic Report on

Artificial Intelligence in Banking

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Abstract

The evergreen domain of banking has always been fascinating. With the advancements in Artificial intelligence, machines and software are getting smarter than ever before. Since banking is a data driven field where complex processes require urgent and consistent attention, the integration of AI and Banking can be proven to be upright. Smart banking has enabled users to manage and track their funds 24 x 7 x 365.

Introduction

Banking is a diversified domain. It mainly consists of transactions, loans, credits and debits, support and security. This report will concentrate on how above-mentioned fields in the banking domain are being enhanced using Artificial intelligence. A National Business Research Institute survey says that over 32% of banking organizations use AI by means of voice recognition to enhance the user experience worldwide. Even though mobile banking is a new technology, as per 2018 data, 81% people use their mobile bank app to manage and track their funds in the bank. 9 out of 10 people agree that, it is more feasible for them to use mobile app over going to a branch.^[1] Being able to do online transaction has morphed a smartphone with a physical wallet. 77% people prefer using credit or debit card over paying with cash, which only indicates the increasing trend of digitization in the field of banking. Chatbot concept has made an impact on banking sector. A chatbot is a block of code that can be added to any website or application. Using AI, the chatbot can help reduce the manual efforts for routine tasks like new bank account opening procedures, applications processing and assisting in online money transfer using a mobile application. Moreover, it has been observed that banking organizations have added voice recognition as AI in the chatbot. Banking is a domain full of confidential data and transactions, using AI, organizations have created tools that detect fraud transactions, credit applications fraud, credential stuffing, scraping and gift card cracking. Algorithms are designed in such a way that if a protocol is not followed, it might categorize the process as threat and alert the authorities. Decryption concepts of artificial intelligence are used to decipher unintelligible strings of

characters into readable bank transactions. For banks, it reduces the number of inquiries and complaints, whereas, for customers it is easier to manage and track transactions.

Artificial Intelligence

What is Artificial Intelligence?

There has always been a question, “Can machines think?” This question has led us to understand the concept of Artificial Intelligence as a branch of computer science that is concerned with building smart machines which can perform the tasks that usually require human intelligence. It is a concept that simulates human intelligence in machines.

Authors Stuart Russell and Peter Norvig describe the concept of Artificial Intelligence by amalgamating their research around the theme of intelligent machines. By that perception, AI is the study of agents receiving stimulus from the surroundings and respond as programmed. In their textbook *Artificial intelligence: A Modern Approach*, authors have explored different approaches that have defined the above-mentioned field in the science world. The first approach concerns with the thought process and reasoning i.e. Thinking Humanly and Rationally, while the second approach deals with behavior i.e. Acting Humanly and Rationally. Artificial Intelligence Systems are powered by either Machine Learning or Deep learning or something as small as applying rules.

Myth:

Superintelligence by 2100 is inevitable

Myth:

Superintelligence by 2100 is impossible

Mon	Tue	Wed	Thr	Fri	Sat	Sun
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	✓	22	23	24	25
26	27	28	29	30		

Fact:

It may happen in decades, centuries or never: AI experts disagree & we simply don't know

Myth:

Only Luddites worry about AI

Fact:

Many top AI researchers are concerned

Mythical worry:

AI turning evil

Mythical worry:

AI turning conscious

Actual worry:

AI turning competent, with goals misaligned with ours

Myth:

Robots are the main concern

Fact:

Misaligned intelligence is the main concern: it needs no body, only an internet connection

Myth:

AI can't control humans

Fact:

Intelligence enables control: we control tigers by being smarter

Myth:

Machines can't have goals

Fact:

A heat-seeking missile has a goal

Mythical worry:

Superintelligence is just years away

PANIC!

Actual worry:

It's at least decades away, but it may take that long to make it safe

PLAN AHEAD!

Need of AI in Banking

Artificial intelligence is a branch of computer science dealing with automating the mundane or procedural tasks while reducing the manual efforts by humans. Banking is a wide area in the field of finance that deals with millions of records of data every single day of the year and as per the experts, data driven industries will be on their peak with advancements in Artificial Intelligence.

The need of Artificial Intelligence in the field of banking is becoming inevitable. Banking industries have begun using smart software in order to be able to provide personalized customer services and analyze the customer data in order to manage and track their business. Simple AI based bot can be considered a chatbot an automated interactive bot that helps new and existing users to accomplish the small tasks like opening an account or requesting a new checkbook or assisting in transferring funds from one account to another. Advancements in AI when it comes to banking will surely lead to reduced human time consumption as it can accurately accomplish simple tasks.

Limitations and Challenges in AI

Artificial intelligence is one of the quickest growing area in the field of computer science. Like all the other concepts, artificial intelligence also has some limitations.

1. One of the major challenges or limitations in Artificial Intelligence is that “building intelligent machines” does not explain what “Artificial” intelligence is and what makes a machine intelligent enough to take the place of human intelligence.
2. Artificial Intelligent system learns from the data that it has been fed. There is no other way to integrate the knowledge, unlike it can be done in human learning. So the inaccuracies in the data might lead to inaccurate results.
3. Artificial intelligent systems are trained to accomplish a defined task. So, an AI system which was designed to play poker cannot assist in helping a user create a bank account.
4. Even though, AI has helped reduce human labor and substitute it with capital and technology. Doing so has led to reduction in fundamental operations in multinational organizations i.e. analysis and decision making that has been done by the project managers and operations managers.
5. Even though Artificial Intelligent Systems are getting smarter than ever before, they still need to be monitored as even a small glitch in the system can cause a huge risk in terms of functionality and results. For example, an AI based chatbot developed by Microsoft named “Tay” was deployed on twitter and the idea was that Tay would

become more intelligent as it was allowed to have conversations with real humans online, but since people like trolling chatbots and because of corrupt information available on the internet, Tay went from tweeting “Hello world” to something that cannot be said out loud in public in just 24 hours.

6. AI systems can think, but only in the way that they have been programmed. Unlike humans, AI systems cannot make second judgement calls. The machines is yet to learn the empathy and compassion of the humans when it comes to critical situations.

Other applications

1. An application that can identify movies, music, advertisements that are played to the device. Pointing a smartphone towards a pair of shoes and then AI can scout that and related product all over world and display the results on your screen at the best price available.
2. A website or an application that watches a company stock for you and gives you suggestions based on historical data if the stock price would rise or fall in the given future.

Banking

Traditional Banking

Even though we live among the machines, the ancient manner of banking has not become outdated yet and while it might seem too old or conventional it has its own array of benefits and repercussions.

Pros of smart banking

Physical presence

Most banks have a brick and mortar branches and ATMs all over the region where it operates, and their services are free to use for their customers. This is a huge advantage over online banking because customers can visit the branch and get their queries resolved by a human rather than over a well-defined machine.

Cash Deposits

Even though online banking gives more flexibility, certain tasks like depositing cash into an account are still contend with a traditional method of visiting a bank and depositing the money manually.

Cons of smart banking

Lower interest rates

Brick and mortar banks have lower interest rates on checking as well as savings account when compared to online platforms like Barclays, Ally bank, CIT, etc.

Poor Customer Service

Physical banks have certain timings when it comes to offering their services and support for their customer and might not be able to provide personalized services for individual customers.

Smart Banking

Smart banking or online banking has revolutionized the finance industry.

Pros of smart banking

Higher interest rates

Online banking has made it possible for bankers to increase the interest rates for customer accounts and the interest rates have increased from 0.1% - 0.5% to 0.9% - 1.0%.

Fewer Fees

The benefit of online or smart banking over traditional banking is that it might save you some money including credit or debit card fees, minimum balance maintenance, direct deposit fees, late fees, etc. This occurs because online banking saves a manual effort by humans and hence costs a little as relatively.

Convenience

Online banking has made the lives of users as well as employees in the field of banking a lot easier and a lot quicker. It is also more advantageous because users can track and manage their funds 24 x 7 x 365 from anywhere in the world. Smart bank applications also allow setting up automatic bill payments and automatic funds transfers. Mobile and email alerts have made it possible for users to authenticate their transactions and inform the authority in case of unknown activities.

Security

It is a myth that online banking is not as safe as the traditional banking.

Reality is, online or smart banking does not risk the privacy of your personal or financial information.

Cons of smart banking

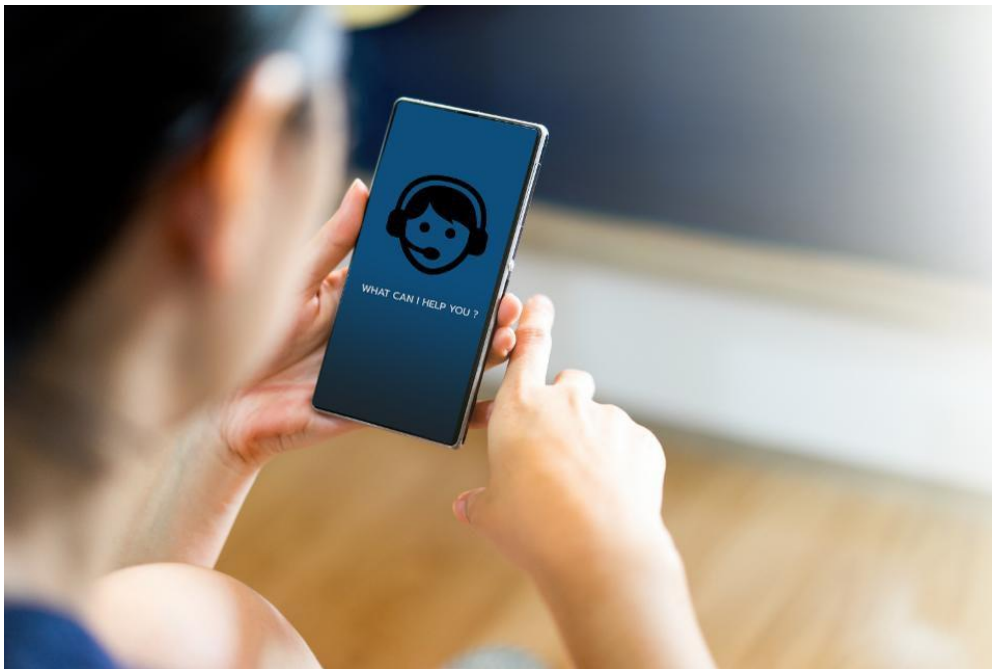
Technological challenges

Online banks have websites for customers to manage and track their funds as per their requirements. It might be difficult for a user that is new to the technology of virtual banking. In such case, if the software is redesigned or functionality is modified, it can be difficult for a user to get used to it.

AI in Banking

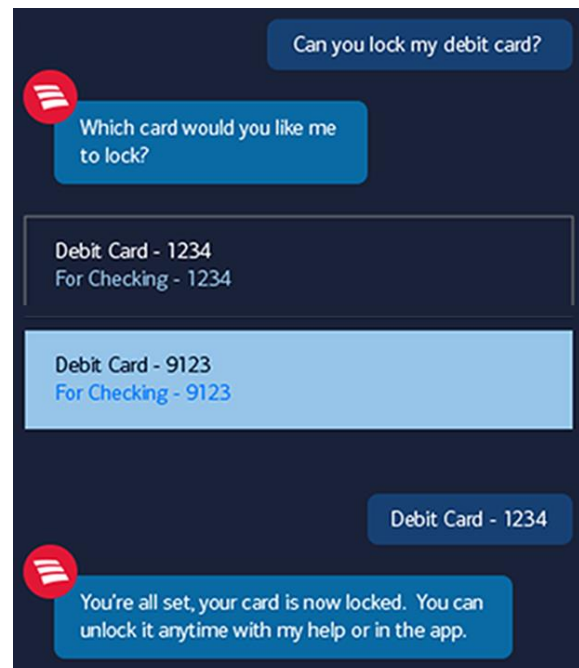
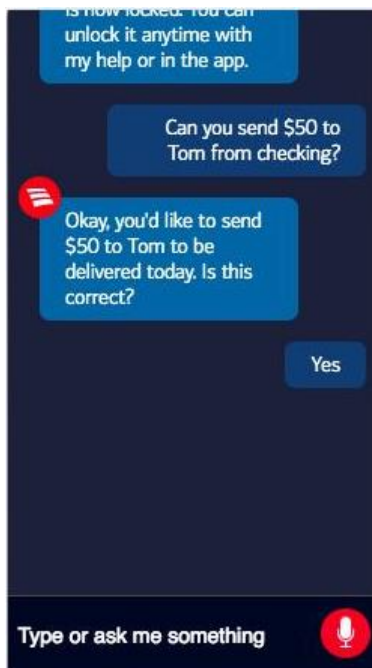
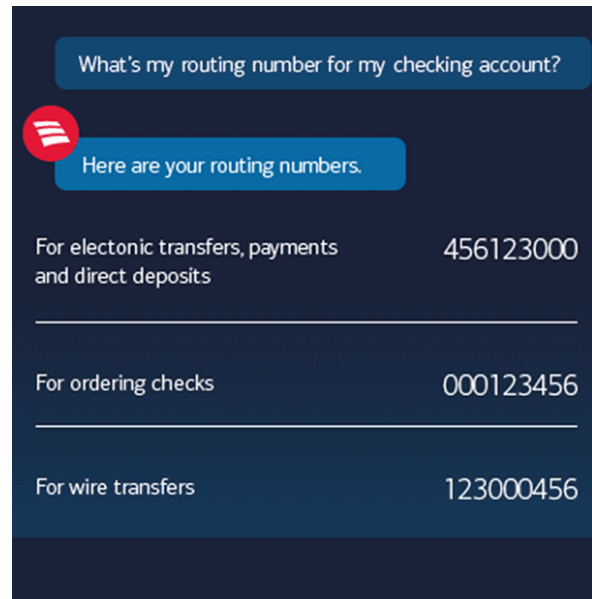
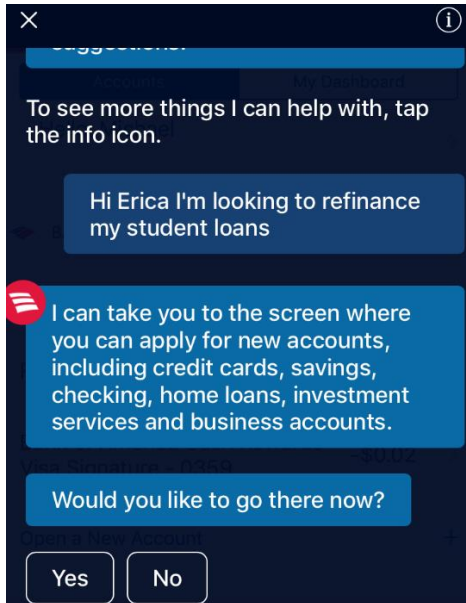
Chatbot

Chatbots are one of the most implemented AI tools that have been in the business since long and are still in the developing phase. These automated virtual advisors help users in accomplishing mundane tasks with ease.



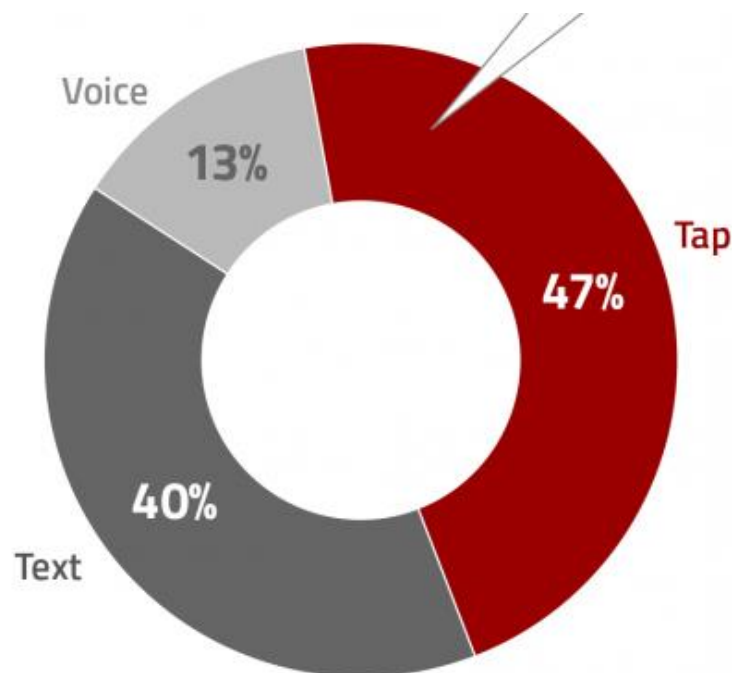
Erica by Bank of America – 2018

Erica is a chatbot designed by the Bank of America. It is an AI based chatbot that combines predictive analysis and machines learning in order to help user of Bank of America mobile applications by enabling them to check their account balance, transfer funds from one account from another account, schedule bill payments, etc. The chatbot takes input in three different ways i.e. tap, voice and text.



Features of Erica

- Chatbot can understand different kinds of input: Tap, voice or text.
- Chatbot can retrieve basic user information which might not be easy to navigate for a new user. For example, routing numbers or Branch locations.
- Get a statement of your transactions.
- Schedule bill payments and face to face meeting with a bank personnel.
- Lock/unlock and change PIN for your debit or credit cards.
- Transfer money from one account to another.



Limitations of Erica

- Users that are not updated with recent trends in AI or banking can face issues in navigating through the chatbot and have a fruitful conversation.
- It might happen that a user gives a command in a slang instead of a formal question, in such case AI might not be able to resolve the query for the user as it might not be programmed that way.
- A chatbot is designed in such a way that it can perform a certain specific

Loans



It has been a lot easier with the help of AI to apply for various kinds of loans. Based on simple attributes like age, gender and marital status and important factors like yearly income, credit history, duration of the loan, interest rate and the reasons for loan, etc. banks have predictive models that can be used to determine if a person is eligible for a loan.

As per National Mortgage News, 71% of all home loan lenders agree that technology is a way to get ahead in the competition in the world of banking. Processing loan and mortgage applications along with deciding the interest rate for the loan or mortgage.

Summary

From the detailed analysis in this report, it can be summarized that the use of artificial intelligence in the field of banking has benefitted the bankers as well as users a lot. With the advent of technology in software domain, it can be said that integration of Artificial Intelligence with operations in banking and finance can help develop tools and techniques to grow the business and increase quality of the user experience.

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