AI in Banking and Finance: Looking Forward

Event Report

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By **SHWETA MOHANDAS**

The Centre for Internet and Society, India

This Report provides an overview of the proceedings of the Roundtable on Artificial Intelligence (AI) in Banking and Finance: Looking Forward (hereinafter referred to as 'the Roundtable'), conducted at The Energy Resource Institute (TERI), in Bangalore on February 7, 2018. The Roundtable was attended by a diverse group of participants from different sides of the AI and banking and finance landscape including representatives from startups, banks, academia, and civil society. The Roundtable discussed various questions regarding the deployment and use of AI in the banking and finance industry.

The Roundtable discussion began with initial observations from research that the Centre for Internet and Society (CIS) is undertaking on the use of AI in banking and finance. This research identified the key uses of AI in finance to be Natural Language Processing (NLP), chatbots, and the prediction of people's financial habits through the use of machine learning. The research also identified a few key AI initiatives in India that are using NLP and chatbots in the banking and finance sector, for example, City Union Bank's Lakshmi chatbot and humanoid robot, Canara Bank's Mitra and Bro (humanoid robot), and ICICI's iPal on its mobile app and website.

The session began with a discussion on the definition and scope of AI in this research project, and as part of this discussion, examined the qualification of chatbots as AI. The roundtable then saw discussion on the impact of deploying AI and included questions concerning bias, regulation, information asymmetry, consumer protection and loss of jobs. The roundtable concluded with predictions on the future of AI in the banking and finance industry.

Identifying and Defining AI

The discussion on the definition of AI identified two approaches, one being an adoption of the pure scientific definition of AI, and the other being to accept the conventional definition of AI used in the industry. The first approach tends to provide the more useful definition of AI for the purposes of research, but must work around the constant evolution of technology that in turn alters the scientific definition of AI. The second approach does not suffer from this problem, but must work around numerous instances where the term AI has been misused to describe something that is not truly AI.

In the case of chatbots, there was detailed discussion on whether they would qualify as AI under different definitions. The source of the answers provided by the chatbots, and the technique utilised to arrive at them are key here to understand this distinction. The answers could all simply be pre-installed replies, which indicates an automated system, and not a true AI, or each answer could be arrived at uniquely, and intelligently, constituting a true AI. Additionally, a true AI chatbot would use NLP to intelligently understand the user's question, identify their needs/requirements, and arrive at an answer that fulfills these needs/requirements.

The key takeaway from this discussion went back to the distinction between automation and AI, and stressed on the need for chatbots to process data and learn from it, in order to

qualify as AI. Unless a chatbot is able to understand the meaning of user queries, and provide satisfactory responses, across a variety of languages, it was stated that they could not replace non-AI based apps that presently serve similar purposes.

Adoption and Development of AI

Adoption

Chatbots were one of the AI tools stated to be popularly utilised by the finance and banking sector in India. Even though companies and departments are keen to offer chatbot services, it was noted that customers remain reluctant to make use of them. This reluctance was attributed to India customers' distrust of AI, and automated systems, especially in financial matters, and it was admitted that Indian customers showed a preference for human interaction.This behaviour is similar to the preference of Indian customers in opting to speak to a human operator, when using an Interactive Voice Response (IVR) system.

Another challenge to the adoption of chatbots in India is the difficulty in ensuring that the customer articulates their query in a form or manner that the chatbot can recognize and respond to. The primary goal of chatbots remains the resolution of customer grievances. This requires an AI that is capable of understanding the customer's grievance, and intelligently arriving at a response that handles the grievance. This is in stark contrast to substandard chatbots which do not possess the capacity to intelligently arrive at responses, and instead create an illusion of intelligence by providing default responses that do not really focus on each customer's specific grievance.

Another reason for the slow uptake of chatbots by customers was stated to be lack of access, due to multiple factors including connectivity, language barriers, and feasibility. However, it was stated that as AI becomes more refined and feasible, banks and other financial institutions would also incorporate more AI into their functions, until it eventually becomes a mainstream service. At this point, it was stated that customers would show significantly less reluctance to utilise AI.

Development

Discussion on the development of AI focused on domestic banks and finance corporations, and the extent to which they developed, and utilised AI in their functions. It was noted that while there are numerous platforms that allow clients to build chatbots and customize them to suit the nature of various unique businesses, actual development of the requisite AI was not popular in India. Instead, AI development was predominantly concentrated in multinational companies such as Google, Amazon, etc., which have sufficient resources both in terms of money as well as data. It was suggested that incentivising open data sets was crucial to encourage domestic development of AI. Additionally, the private sector in India would have to adopt policies and practices that facilitate smaller players to use data and develop their own AI, if domestic development was a goal to be achieved.

Challenges to AI in Banking and Finance

Following the discussion on the development of AI, the roundtable proceeded to discuss some of the challenges that are faced during the deployment of AI in the Indian banking and finance sector.

Language

One of the most basic problems identified with regard to the deployment of AI, especially within chatbots in India, was that of language barrier. This problem is one that hinders accessibility, and is present at two stages. First, most AI is developed in countries, and by companies which rarely recognise Indic languages. This creates an obstacle to any banking or finance service that wishes to utilise the AI to reach the majority of Indian users. Secondly, the data sets fed to the AI are collections of predominantly English data. This makes it significantly difficult for the development of an AI that can understand and communicate in local languages. Though there have been recent efforts to collect data in more local languages, these problems are far from being successfully resolved. One possible solution suggested at the roundtable was the increased integration of speech recognition technology, as a means to collect diverse data on different languages that could be utilised as a tool to teach AI to function in Indian languages. It was noted that this solution was successfully implemented in China, where chatbots have now brought about a change in the service industry. Though the diversity of languages in India is comparatively higher, India could still utilise this speech recognition solution and bring about a greater implementation of AI in the banking sector.

Bias

Bias is a problem that generally affects AI decision making, and it was agreed that it could be especially damaging in the banking industry. It was pointed out that, even in the existing human-based system, banks in India are heavily biased in making decisions, like those to do with the granting of loans. If an AI was developed, and it used a data set based on historical data to learn from, it would simply internalise the existing bias and perpetuate the problem. Hence it was unanimously agreed upon that there was an imminent need to develop techniques that ensure that the data used is free from bias.

However, it was also agreed upon that a final solution to solve the difficult problem of bias was still under development, and that for more apparent bias, there could be safeguards within the model of the AI to prevent biased results. For biases that are less apparent, and take longer to become visible, a flawless solution is yet to be developed.

Looking forward, it was predicted that liability would also become a major issue if bias is not appropriately handled. Presently, it was stated that loan denial due to algorithmic bias would render the bank manager responsible to the consumer. However, a regulator would be likely to hold the developer of the AI responsible.

One suggested solution to address bias in decision making was to have an AI that could justify or explain the decision making process. Tied to this, it was also clarified that several established banks that collaborated with Fintech startups required them to produce their algorithms for scrutiny. Presently, this is done for the purpose of banks safeguarding against the systems having negative consequences on either the bank, or the consumer. As a part of this process, the Fintech companies are required to prove ex ante that the algorithm is not discriminatory. Thus, it was mentioned that, as the system stands today, banks do consider the elimination of algorithmic decision making bias as a part of their duty of care.

Regulation

One of the pertinent questions that was asked with regard to bias was whether India had the required regulatory framework to deal with algorithmic biases. It was pointed out that presently, in the context of finance in India, the core regulators were the RBI, IRDA and SEBI. It was also stated that in SEBI's set of working guidelines[1], automated decision making is mentioned in two clauses. These guidelines create a liability framework where liability falls on the developer or the employer of the automated decision making tool. It was noted that these clauses mirror a three decade old OECD EU[2] instrument, which was was not drafted keeping AI in mind. On the question of the possible regulating entity for AI in the finance sector, a number of entities were suggested, including banks, the RBI, or the soon to exist Data Protection Authority likely to be formed under a new Data Protection Act. To avoid the perpetuation of historical bias due to reliance on historical data, it was stated that the regulator would need to bring the treatment of data already held by banks under its ambit, as well as data newly collected through AI solutions.

The question of data being stored and processed by the banks brought up the use of chatbots as an assistant. These chatbots were stated to collect customer data with each reply to a customer's query, which was then stored in the bank's database. The data collected and stored must also be subject to regulation as must the methods of collection, processing, storage, and sharing of the data by the bank.

The important takeaway from the discussion of the regulation was that the regulation needs to address the entire of cycle of data collection, beginning with the source of data, and the consumer's consent, followed by the techniques utilised in analysing, and processing, followed by checks for apparent bias within the algorithm, and testing for non-apparent bias.

Excessive regulation in the area of AI can serve as a hindrance to innovation and disincentivize the development of AI. In order to prevent this, the idea of a Remediation Model[3] was suggested. In such a model, if the developers recognise a flaw, or a bug in the AI model, and take steps to address it, the developers would not face any liability. The onus here is on the developers to build an AI that is close to perfect, and to rectify any problems as soon as they are detected. Additionally, due diligence as a possible standard to assess and assign liability was also discussed at the roundtable. If a developer could demonstrate that pre-defined, or reasonable measures were taken to ensure due diligence when developing the AI, they could be immune or be held only partially liable. It was also

[1] https://www.sebi.gov.in/sebi_data/attachdocs/1475839876350.pdf
[2] http://foundation.ifmr.co.in/wp-content/uploads/2017/11/Privacy-On-The-Line.pdf
[3] http://takshashila.org.in/wp-content/uploads/2017/07/TDD-Beyond-Consent-Data-Protection-RM-2017-03.pdf

suggested that the regulation should not focus on penalising developers for unintended consequences as much as it must focus on the responsibility to address these problems and take preventive measures.

The Payment Card Industry Data Security Standard (PCIDSS) was suggested as another possible standard. At present the PCIDSS's auditing process is based on the principle that if any actual harm is caused, the perpetrator must always be identified. In a similar way, the AI could be audited to check for the source of biases. There will be technical differences between the two audits however, since the auditing for bias will have to account for the dynamic nature of code and AI, and in the case of liability, will have to identify specific developers who are responsible for causing the problem. Similar to the PCIDSS, the Payment Card Industry (PCI)[4] saw the invention of a tool that looked at the violation, and transmitted the details of the issue directly to the PCI. This was stated as a model that could be emulated in AI, where transparency could be achieved through frequent audits, the results of which are simultaneously and instantly transmitted to the regulator and the developer.

Further discussion on regulation produced the view that a binary harm test could very well "kill" the development and utilisation of AI in the country. Present regulatory systems only allow for the binary options of penalty or acquittal. It was suggested that by diluting the existing regulatory standards, and having useful interventions, a middle path could be chalked out that fosters the growth of AI, while also effectively regulating it to the right extent. These useful interventions could be in the form of mystery shopping (where the regulator would anonymously test the system for flaws), audits, warnings, and continuous dialogue between the regulator and the companies.

The discussion on regulation concluded with procedural systems of regulation in India. Most cases, it was stated, are transferred to a court after the designated regulator fails to provide an adequate solution to the problem. This is only reflective of the flaws in the existing regulatory system created to reduce the burden of the courts. It was stated that there could be internal procedures that the developers, or implementors of AI could follow, accompanied by various levels of liability for offences. In the case of more serious offences, a strict liability regime could be put in place. A truly effective and robust regulatory regime would be one that not only serves as a check on system, but also reduce the burden on the courts.

Information Asymmetry

Data is fundamental to the success of an AI model, and any AI becomes more successful, and more profitable, as increasing amounts of data is fed to it. This can often create a mismatch between the motivations of the users and the service providers, and can create information asymmetry. The fact that consumers are not always aware of the extent of information that is being collected and put to use by AI driven systems was pointed out as a reality in most systems. This could often result in situations where a consumer's data is collected and utilised by a decision making process without the consent, or knowledge of the consumer. The use of blockchain technologies, which enable transparency, and increase accountability in the financial system, was discussed as one possible solution towards addressing the information asymmetry.

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[4] **http://www.banktech.com/compliance/pci-compliance-the-risks-banks-can-miss/a/d-id/1295190?**

Consumer Protection

In the context of fintech, if a consumer has a complaint or there is a consumer dispute, the dispute would be resolved through the 'chargeback' system. There is also the requirement that these companies are certified by PCIDSS, providing a level of regulation over these services. The nature of these complaints would be different in case of AI powered services, as a majority of consumer complaints would arise from how the system interprets data. Consumer redressal in AI is difficult as not all the AI systems could provide reasons of how it came to the decision. For example, in the case of neural networks, it was difficult to know how the decision was made, although there has been some scientific progress on their interpretability.

Establishing a "norm" within a group consumers was also discussed, where it was stated that once a norm was identified and established, a bias could be understood as a deviation from that norm. However, some norms would take a considerable amount of time to develop within society, and would be difficult to identify, while other norms take fairly short amounts of time to develop, or are already established (bias based on age is complex and a norm here is difficult to identify, while the norm in gender is much clearer, and the bias is very apparent and identifiable). It was stated that identifying norms, even difficult ones, while designing AI, and accounting for corresponding biases, was crucial to avoid irreparable damage to consumers.

Although AI has the potential to cause consumer protection issues, there are studies that show that not all consumers are averse to the use and collection of their data. In a study conducted on a diverse dataset of customers from various socioeconomic backgrounds in India, it was found that most customers trusted their bank managers, even though they did not always trust the banks themselves. The same people were not averse to their banks collecting their data for customization, although they had a reasonable expectation and trust that the bank would not misuse their data. This trust was causally linked to their relationship with the bank manager, and the study was used to demonstrate the importance of human interaction in the banking sector. This indicates the possibility of a future where AI does not replace jobs in the banking sector, but instead serves as a tool to augment existing human jobs.

Substitution of Human Labour

The discussion then transitioned to the change that AI would bring to the banking and finance labour force. Several examples were discussed here, which dealt with AI being utilised by banks to improve customer acquisition, replace tasks to reduce expenditure, save training time, and get a head start over competitors. These applications could also be beneficial in terms of uniformity and consistency, providing the same quality of service at a significantly larger capacity than possible by a human employee. Other examples of the use of AI included using basic AI to drive alternate forms of lending in order to then improve the creditworthiness of a customer. There are also other forms of simple augmentation that are

being done by apps such as Moneyview[5], Moneytab[6] and Scripbox[7]. These companies collect data about the user's saving habits and suggest products accordingly.

Future of AI in Banking and Finance

The use of AI in banking and finance, though in its nascent stages in India, is slowly gaining ground. On the subject of the future uses of AI, it was suggested that AI that could help in correcting the errors that came up in peer to peer transactions processed by the banks. Additionally, AI can help in increasing financial inclusion by allowing a system of decentralised banking. This system could even potentially disrupt the stronghold of the big banks - a system where the AI could verify the parties and thereby connect the lender to the borrower securely and privately. This system could also identify the repaying habits of the lender and establish their creditworthiness.

The session also discussed the changes that data collection and storage companies would effect with the launch of their payment systems. The most pertinent questions asked was whether they would be considered as financial institutions and if they would create problems for smaller financial startups. It was stated that these companies would come under the same regulation as fintech apps, and that the laws of antitrust would act as a check on their powers.

Conclusion

The Roundtable provided useful insights into questions revolving around the use of AI in banking and finance. As technologies such as AI and machine learning run on analytics, there is a graver need to ensure accuracy, considering the monetary risk involved. If India is able to overcome the challenges that are impeding the deployment of AI, AI could improve the financial sector in India by improving financial inclusion.

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[5] **https://moneyview.in/**
[6] **https://www.moneytap.com/**
[7] **goo.gl/eK6Qch**