

How Artificial Intelligence is Transforming the Banking Industry: Data Analysis Review

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Abstract: *AI or Artificial Intelligence, is one of the foremost technologies, which has its potential impact on almost every field. It is an immensely integral component of Computer Science. A technology that intends to provide computer systems and machines the ability to carry out and execute tasks without manual intervention, it simply enables them to work smartly. In simple words, we can say that Artificial Intelligence is about giving human intelligence to machines. This is one of the most noteworthy and remarkable aspects of AI. It plays a significant role in making machines capable of making decisions and that too, faster and better than humans. And all these decisions are data-driven. Artificial Intelligence (AI) is a prominent technology that is continuously evolving day by day, due to which it has become so much prevalent. It is beneficial in diverse fields such as education, business, marketing, healthcare, medicine, agriculture, automobiles, robotics, etc. AI is also quite predominant in the banking and finance industries. AI technology facilitates banking processes as it helps automating most of the tasks, if not entirely, minimizing manual requirements. In this research paper, we will see how implementation of artificial intelligence is assisting the banking and financial industry by improving their operational efficiency and enhancing their productivity. The research paper document also consists of a survey study done through data analysis domain for determining the use of artificial intelligence in banks who have adopted the technology.*

Keywords: Artificial Intelligence, Banking Industry, Banking Services, Financial Industry, Online Transactions, Fraud Detection, Fraud Prevention, Chatbots and Virtual Assistants. Face Recognition, Pattern recognition.

I. INTRODUCTION

Artificial Intelligence is a technology that has been integrated and developed through conscious efforts for mimicking human brain in order to be able to recognize and investigate large number of complex problems and to provide innovative solutions to them through a holistic human approach. Artificial Intelligence and its applications are ubiquitous and can be seen everywhere. Because of its multidimensional features such as image recognition or face recognition, text to speech conversion and vice versa, virtual personal assistants and chatbots, automatic language translation, natural language processing, etc, Artificial Intelligence (AI) is also eminent in the financial sector as well. Since banks are responsible for managing vast amount of money deposited by its customers/clients, there is always a severe threat of loss of money due to frauds and scams. With AI, the chances of frauds and scams are minimized due to its fraud prevention and fraud detection features as AI techniques and strategies are competent in identifying frauds in online bank transactions. AI offers extensive security to banks in terms of transactions. It provides comprehensive facilities for preventing frauds in online banking. AI also plays a key role in tackling credit card frauds. AI algorithms are crucial in determining the authenticity of credit card users who are involved in these credit card transactions. The technology is helpful in verifying whether the credit card belongs to the genuine user/client or not and also ensures the validation of the same. AI is also useful for checking credit card transactions in real time basis so as to block transactions in case of any risks. This way, AI technology facilitates security in credit card transactions in a plausible manner.

Artificial Intelligence also helps banks in providing better customer experiences through personalized and customized banking options as well as smart services. A pivotal application of AI are Chatbots or virtual assistants. Chatbots and interactive voice-response systems which utilize Natural Language Processing are increasingly used by banks to increase the efficiency of their services. Chatbots are digital assistants that interact with clients by text or voice and aim to address their requests without the involvement of a bank employee. These are specifically designed to simplify the interactions between computer systems and humans, Banks make use of AI technology for reliable automated customer support features.

AI's robust features are also used in various aspects of banking services such as passbook updating kiosks, cash deposit machines, ATMs, mobile banking, etc. The face recognition feature of AI is credible in terms of security for ATM cameras. Apart from that, face recognition also helps in customer authentication. The pattern recognition feature of AI technology helps banks to generate hidden patterns and correlations by examining data. Understanding these patterns help banks make predictive analysis for better customer recommendations and also for predictive maintenance of its own resources.

II. OBJECTIVE

The main motive of this research paper is to study how artificial intelligence is influencing the banking and financial services. This document should provide a good understanding of how Artificial intelligence is involved in almost all the tasks done in banking industry as well as how banking services are thriving with the help of AI. It is a review paper which involves a survey analysis on the use of artificial intelligence in banking sector.

III. DATASET DESCRIPTION

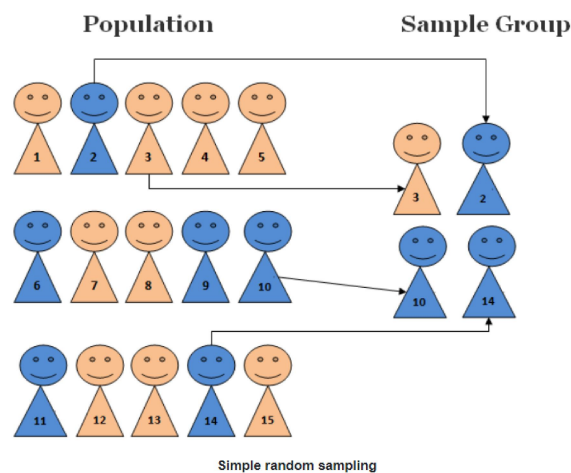
3.1 Type of Data

The data gathered for the mentioned research paper was Primary data and Secondary data, which is both quantitative and qualitative data, which was further analyzed in order to draw conclusions and suggestions. Primary data was gathered through a survey on awareness of 112 individuals from selected banks about uses of artificial intelligence in banking sector. A questionnaire was drafted for the survey and random sampling was done. The research instrument used to gather quantitative data was a formal and closed questionnaire. Secondary data collection was done through internet which includes web, e-magazines, research papers, e-books, news papers etc.

3.2 Architecture of Data

A. Random Sampling

Simple random sampling (also referred to as random sampling) is the purest and the most straightforward probability sampling strategy.



It is also the most popular method for choosing a sample among population for a wide range of purposes. In simple random sampling each member of population is equally likely to be chosen as part of the sample. It has been stated that “the logic behind simple random sampling is that it removes bias from the selection procedure and should result in representative samples”.

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IV. RESEARCH METHODOLOGY

In this review paper, the study is done making use of clear, concise and informative analysis methods. This is because it is mainly a quantitative study. And these methods help to gather substantial quantitative data which is necessary in order to acquire a deeper insight into the relationships between different research variables.

The research design is exploratory and descriptive. Since the research for this review paper basically comprises of in-depth surveys in addition to qualitative and quantitative analysis, the type of research undertaken is exploratory. The research is conducted with the help of data analysis and it is a descriptive research as well as analytical since it is mainly focused on facts and information already collected.

The research approach to this study was based on a sample used to collect key quantitative data from respondents. The survey method was chosen here to collect data by surveying 112 clients from selected banks. The research instrument used here to gather quantitative data was a formal and closed questionnaire. Quantitative data analysis was conducted using SPSS 21.0 software.

4.1 Steps involved in the Quantitative Data Analysis

- 1. Editing Data:** open-ended questions of interviews & questionnaires, or unstructured observations
 - Editing should be done on same day data collected so respondents (if not anonymous) may be contacted for further info or clarification.
 - Incoming mailed questionnaire data
 - Inconsistencies that can be logically corrected should be rectified and edited at this stage
- 2. Handling Blank Responses**

Throw out questionnaire if >25% of questions unanswered

 - Handle a blank response to an interval-scaled item with a midpoint:
 - Assign the midpoint in the scale
 - Allow the computer to ignore the blank responses
 - Assign the mean value of the responses
- 3. Coding using scanner sheets for collecting questionnaire data** use a coding sheet first to transcribe data from the questionnaire and then key in data
- 4. Categorizing Group items measuring same concept together** Reverse numbering of negatively worded questions
- 5. Entering data**
 - Enter data from scanner answer sheets directly into computer
 - Enter raw data through any software program, e.g., SPSS Data Editor, Excel.

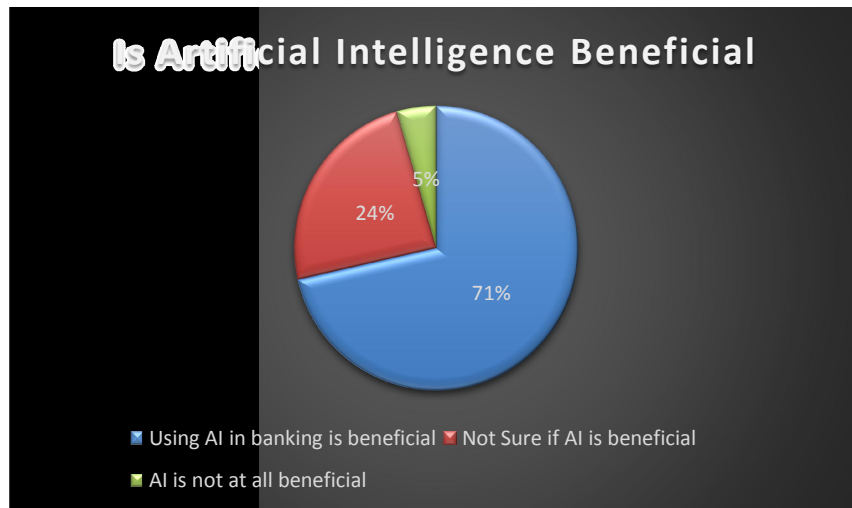
V. RESEARCH ANALYSIS

This analysis is based on data collected from 112 respondents. Majority of the respondents in mid 20s, 30s and 40s are most impacted by artificial intelligence in banking sector and they also agree that artificial intelligence is valuable and

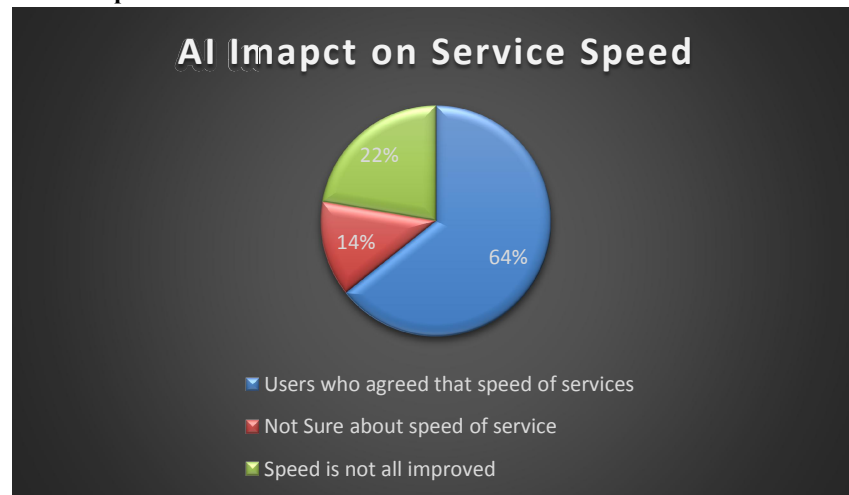
friendly, and they look in for introduction of new innovations in AI from time to time. 71.4% i.e., 80 people out of 112 think using artificial intelligence in banking is beneficial. 24.1% i.e., 27 people out of 112 are not sure that using artificial intelligence in banking is beneficial. 4.5% i.e., 5 people out of 112 don't think that it is beneficial at all. 58.9% i.e., 99 people out of 112 are taking benefit of automated financial advisor for investing money in the market. 64.3% i.e., 72 people out of 112 agree that after implementing artificial intelligence in banking system has improved speed of services. 13.4% i.e., 15 people out of 112 are not sure that it has improved or not. 22.3% i.e., 25 people don't agree that it has any impact on fast services.

5.1 Is Artificial Intelligence Beneficial?

Total No. of respondents	112
Using AI in banking is beneficial	80
Not Sure if AI is beneficial	27
AI is not at all beneficial	5

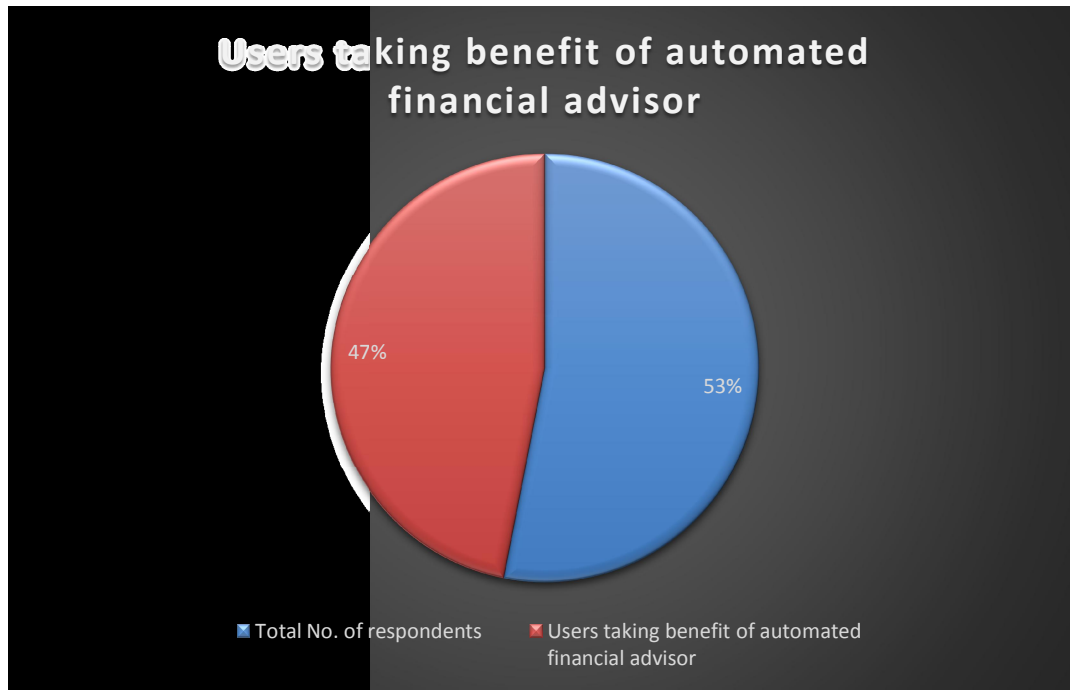


5.2 AI Impact on Service Speed



5.3 Users taking benefit of automated financial advisor

Total No. of respondents	112
Users taking benefit of automated financial advisor	99



Most of the respondents prefer smart wallets over cash transaction which means people are taking benefits of artificial intelligence. As online fraud is a major issue nowadays, people can easily hack into your account, 81.4% respondents believe that artificial intelligence can double the security system in banks. 18.6% people do not fully trust the machines, they need a little bit of human touch and prefer visiting the banks in traditional ways.

VI. CONCLUSION

In conclusion, we can say that Artificial Intelligence or AI is slowly and steadily converging towards becoming an inevitable and indispensable part for banking and financial services. Incorporating AI technology in banks and financial services helps in simplifying the hectic and tedious manual tasks through automation.

AI is also applicable for carrying out decision-making effectively since, it has the ability of making intelligent data-driven decisions based on previously existing data. Besides, it is particularly used for analyzing complex and large scale datasets containing vast amount of data. Implementing AI technology helps banks in faster and effortless processing of large amounts of data. Hence, banks are inclined for making use of AI technology for managing immense volumes of data with flexibility and convenience.

AI also focuses on enhancing pattern recognition through these datasets. AI is efficient in finding patterns in real time and discovering valuable insights from those patterns. It helps banks in understanding customer/client behavior patterns, predict future outcomes and initiate suitable measures and actions in order to accomplish these outcomes and achieve desired results with ease. Ai is also useful in countering or mitigating the risks and threats associated with banks. Moreover, AI technology revolves around algorithms, which are generally a set of rules, instructions and other problem-solving operations that are designed to be followed by computers and it provides accurate and diligent results. AI is able to provide apt and appropriate solutions for the various challenges in the banking industry.

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