**LITERATURE REVIEW**

**AI-based Chatbot Service for Financial Industry**

Okuda, T. and Shoda, S., 2018. AI-based chatbot service for financial industry. *Fujitsu Scientific and Technical Journal*, *54*(2), pp.4-8.

In light of recent trends toward enhancing customer contact points, companies must clarify the issues they face, how they intend to solve them, and their specific objectives while aiming for step-by-step improvements. To this end, many companies are starting to provide “chatbots” to automate communication with people using computers as a service for interacting with customers. This movement is also being felt in the financial industry that handles a variety of complex products and services, and there are already cases of using chatbots for customer support and sales. Fujitsu has developed FUJITSU Financial Services Solution Finplex Robot Agent Platform (hereafter, FRAP), an AI-based enterprise chatbot service. FRAP achieves automatic robot support of financial-product sales and customer support by having users converse in a chat format with a robot having knowledge accumulated by machine learning. This paper first introduces trends in enterprise chatbot services and examples of using them in business applications. It then presents a case study of introducing FRAP in Sony Bank Inc. and describes its features.

**Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language**

S. F. Suhel, V. K. Shukla, S. Vyas and V. P. Mishra, "Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language," *2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)*, 2020, pp. 611-618, doi: 10.1109/ICRITO48877.2020.9197825.

Artificial Machine Intelligence is a very complicated topic. It involves creating machines that are capable of simulating knowledge. This paper examines some of the latest AI patterns and activities and then provides alternative theory of change in some of the popular and widely accepted postulates of today. Based on basic A.I. (Artificial Intelligence) structuring and working for this, System-Chatbots are made (or chatter bots). The paper shows that A.I is ever improving. As of now there isn't enough information on A.I. however this paper provides a new concept which addresses machine intelligence and sheds light on the potential of intelligent systems. The rise of chatbots in the finance sector is the latest disruptive force that has changed the way customers interact. In the banking industry, the introduction of Artificial Intelligence has driven chatbots and changed the face of the interaction between bank and customers. The banking sector plays an important role in development into any country. It also explores the existing usability of chatbot to assess whether it can fulfill customers ever-changing needs.

**Artificial Intelligence and  NLP -Based  Chatbot for Islamic Banking and Finance**

Khan, S. and Rabbani, M.R., 2021. Artificial intelligence and NLP-based chatbot for islamic banking and finance. *International Journal of Information Retrieval Research (IJIRR)*, *11*(3), pp.65-77.

The role of artificial intelligence (AI) is becoming increasingly important in the field of banking and finance. It has come a long way, and the trend is likely to continue for some time in the future as well. This research study reviews the role of artificial intelligence and use of technology in the finance and banking industry and how AI has changed the way the banks and financial institutions do their business. Customer engagement is one of the most critical parts of the finance and banking industry. This research proposes an artificial intelligence and natural language processing (NLP)-based chatbot model for advising the customers of Islamic banking and finance. Presently, the proposed chatbot is the first chatbot that will help the Islamic finance and banking customers to interact in real time and get Islamic financial advice based on the principles of Sharia related to individual's financial needs.

**Toward a Chatbot for Financial Sustainability**

Hwang, S. and Kim, J., 2021. Toward a chatbot for financial sustainability. *Sustainability*, *13*(6), p.3173.

This study examines technology effectiveness for industry demand in which artificial intelligence (AI) is applied in the financial sector. It summarizes prior studies on chatbot and customer service and investigates theories on acceptance attitudes for innovative technologies. By setting variables, the study examines bank revenue methodologically and assesses the impact of customer service and chatbot on bank revenues through customer age classification. The results indicate that new product-oriented funds or housing subscription savings are more suitable for purchase through customer service than through chatbot. However, services for existing products through chatbot positively affect banks’ net income. When classified by age, purchases by the majority age group in the channel positively affect bank profits. Finally, there is a tendency to process small banking transactions through the chatbot system, which saves transaction and management costs, positively affecting profits. Through empirical analysis, we first examine the effect of an AI-based chatbot system implemented to strengthen financial soundness and suggest policy alternatives. Second, we use banking data to increase the study’s real-life applicability and prove that problems in customer service can be solved through a chatbot system. Finally, we investigate how resistance to technology can be reduced and efficiently accommodated.

**Banks Banking on AI**

Singh, K., 2020. Banks banking on ai. *International Journal of Advanced Research in Management and Social Sciences*, *9*(9), pp.1-11.

The scope for artificial intelligence is believed to be effectively limitless, and this field of computing is proving extremely promising. It is projected that worldwide revenue from the AI market would reach as high as 97.9 billion U.S. dollars by 2023. Software and information technology companies are investing heavily in artificial intelligence. AI-focused startups have been gaining momentum and interest from investors, with the funding of AI-startup

**Role of Chatbot in Customer Service: A Study from Perspectives of the Banking Industry of Bangladesh**

Sarbabidya, S. and Saha, T., 2020. Role of chatbot in customer service: a study from the perspectives of the banking industry of Bangladesh. *International review of business research papers*, *16*(1), pp.231-248.

The current study found the feasibility of using chatbots because of its varied forms of benefits in rendering customer service which include i) gathering feedback and suggestions from the customers via simple questionanswer interaction so that the lead page of the website of the concerned organization can be improved, ii) assisting users in navigation on the site, to limit the amount of clicks and to shorten the time to reach the desired information or product so that social relationships and emotional bond with customers can be built by increasing their confidence in the company, iii) using Natural Language Processing (NLP) to give unique feel in human-like conversations and personalized response to its customers and many more. Thus, chatbots centric services can be considered to enable effective customer service and thus ensure business growth and development of the online banking in Bangladesh.

**[Chatbot Implementation in Customer Service Industry through Deep Neural Networks](https://ieeexplore.ieee.org/abstract/document/9752271/)**

Dihingia, H., Ahmed, S., Borah, D., Gupta, S., Phukan, K. and Muchahari, M.K., 2021, December. Chatbot Implementation in Customer Service Industry through Deep Neural Networks. In *2021 International Conference on Computational Performance Evaluation (ComPE)* (pp. 193-198). IEEE.

It is the age of artificial intelligence (AI). As AI, machine learning, and Deep Learning (DL) have been progressing, machines have also advanced to emulate humans. A good example of such a machine is chatbots, which can talk like human, uses AI and NLP, can be a virtual assistant for customer experience. This paper provides a implementation of how chatbots work and the implementation of its techniques that can be used to create them. It compares and contrasts the current chatbots, as well as their strengths and weaknesses. Comparison is based on the functionalities and technical requirements of the most common chatbot application systems. According to research, nearly 75% of consumers have had bad customer service and coming up with substantive, lengthy, and insightful answers remains a difficult task. We used an encoder-decoder attention mechanism design to build the Seq2Seq AI Chatbot. This encoder-decoder makes use of LSTM cells in Deep RNNs. Instead of a specific chatbot that is used for a certain purpose, we wanted to design a general chatbot that can conduct general discussions with us like a friend. However, the model we'll employ can be trained on other datasets for different purposes. We have built a chatbot to talk about everyday conversations.

**Emerging-market consumers’ interactions with banking chatbots**

Mogaji, E., Balakrishnan, J., Nwoba, A.C. and Nguyen, N.P., 2021. Emerging-market consumers’ interactions with banking chatbots. *Telematics and Informatics*, *65*, p.101711.

Chatbot development and adoption is a growing challenge in emerging markets, which are characterised by a young population structure, low-level internet penetration and a high degree of institutional adversity. The purpose of this study is to explore how consumers in emerging markets interact and engage with banking chatbots when conducting bank transactions. Based on qualitative research using semi-structured interviews with 36 Nigerian residents, this study demonstrates that the four factors of the unified theory of acceptance and use of technology (UTAUT) can explain how emerging-market consumers interact and engage with banking chatbots. While age and technological experience are significant components in facilitating the use of chatbots, perceived expertise, responsiveness and security were found to be particularly important to users. This study delves into user experiences with conversational interfaces, specifically focusing on emerging markets.