Bank Info Bot 5

by Rohit Venugopal

General metrics

16,186	2,368	163	9 min 28 sec	18 min 12 sec
characters	words	sentences	reading time	speaking time

Score

This text scores better than 69% of all texts checked by Grammarly

Writing Issues

176	56	120
Issues left	Critical	Advanced

Writing Issues

56	**Correctness**	
9	Misspelled words	
6	Improper formatting	
4	Conjunction use	
2	Pronoun use	
4	Wrong or missing prepositions	
11	Determiner use (a/an/the/this, etc.)	
7	Comma misuse within clauses	

2	Incorrect noun number	
3	Incorrect verb forms	
7	Confused words	
1	Faulty subject-verb agreement	

8 Clarity

8	Wordy sentences	

Unique Words

Measures vocabulary diversity by calculating the percentage of words used only once in your document

36%

unique words

Rare Words

Measures depth of vocabulary by identifying words that are not among the 5,000 most common English words.

37%

rare words

Word Length

Measures average word length

5.4

characters per word

Sentence Length

Measures average sentence length

14.5

words per sentence

Bank Info Bot 5

Bank Information Bot using DialogFlow[1]

Submitted in partial fulfillment of the requirements of the degree of

Master of Engineering

by

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Project Report Approval for M. E.

This project report entitled

Bank Information Bot using DialogFlow[2]

by

Rohit Venugopal

is approved for the degree of_____.

Examiners

1.

2.

Supervisors

1.

2.

Date:

Place:

Declaration

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

One of the most significant breakthroughs in recent years has been the development of transformer-based models, such as OpenAI's GPT-3 and Google's BERT. These models leverage large-scale pre-training and fine-tuning to achieve state-of-the-art performance on a wide range of NLP tasks, including chatbots. GPT-3, for example, can generate human-like text and engage in coherent and contextually appropriate conversations, thanks to its ability to process and generate language based on vast amounts of training data. Research by Vaswani et al. on the transformer architecture has been foundational in this regard.

The application of chatbots spans numerous domains, including customer service, healthcare, education, and entertainment. In customer service,

chatbots are used to handle routine inquiries, provide support, and improve response times, as demonstrated by studies conducted by companies like IBM and Salesforce. In healthcare, chatbots assist with patient triage, appointment scheduling, and providing medical information, as evidenced by research on systems like Babylon Health and Ada Health. Educational chatbots, such as Duolingo's language-learning assistant, provide personalized tutoring and feedback, enhancing the learning experience.

Despite their advancements, chatbots face several challenges that continue to be the focus of research. Ensuring natural and contextually appropriate responses remains a critical issue, particularly in maintaining coherence over extended conversations. Addressing bias and ethical concerns in chatbot interactions is another significant area of study, as highlighted by researchers like Timnit Gebru and Joy Buolamwini. The integration of multimodal inputs, such as speech and visual cues, is also an emerging field, aiming to create more immersive and interactive chatbot experiences.

Introduction

Bank Info Bot is a chatbot that provides information about banks when the user inputs their IFSC Code. IFSC stands for Indian Financial System Code. It is an

11-digit alphanumeric code that is unique to each bank branch in India. The Reserve Bank of India (RBI) uses IFSC codes to identify and classify branches, and to facilitate electronic payments and money transfers. IFSC codes are used for online fund transfers via NEFT (National Electronic Funds Transfer), IMPS (Immediate Payment Service), or RTGS (Real Time Gross Settlement).

We are using DialogFlow as a chatbot, FastApi as a web framework, MongoDB as a Database here. We will be scraping information using Websites https://ifsc.bankifsccode.com and https://www.askbankifsccode.com respectively.

We have partial information in the Website https://ifsc.bankifsccode.com which includes Bank Name, Address, State, District and Contact number. The other partial information is scrapped from https://www.askbankifsccode.com which includes Bank Name, Address, State, District, Contact number and Email ID as well. The common information is compared and then processed for the output whereas the unique information goes in as it is.

The user can query chatbot via multiple mediums like Web,Dialogflow Messenger and Telegram through Text and Voice input. The IFSC queries get logged in MongoDB and the results also get stored there, and when there is a repeat IFSC query, it will first look in knowledge. If not then it will go outside.

Problem Statement

According to Google, there are 1,33,034 total bank branches in India including Small Finance Banks and MNC Banks. No bank information is directly available online. Even if it is available online, we only get basic information like Bank Name, Address, State, District and Contact number. The contact number is not necessarily right all the time. But we do not get the crucial information like

email id's[21] and the right contact numbers when we want. So one has to search all the web for the information and this is of course time consuming.[22]

Literature survey

Chatbots, also known as conversational agents, have become increasingly prevalent in various industries due to their ability to simulate human-like

interactions and automate communication processes. The evolution of chatbots can be traced back to early efforts in artificial intelligence and natural language processing (NLP). One of the earliest examples is ELIZA, a program developed in the 1960s by Joseph Weizenbaum that used pattern matching to simulate a conversation with a psychotherapist. While rudimentary, ELIZA demonstrated the potential of chatbots to engage users in meaningful dialogues.

The development of chatbots has been significantly influenced by advancements in NLP and machine learning. In the late 1990s and early 2000s, rule-based systems dominated the landscape, relying on predefined scripts and decision trees to guide conversations. However, these systems were limited in their flexibility and scalability. The advent of statistical methods and machine learning algorithms marked a turning point, enabling chatbots to learn from data and improve their performance over time. Research by authors such as Eric Brill and others on transformation-based learning and part-of-speech tagging laid the groundwork for more sophisticated language models.

The emergence of deep learning has revolutionized the field of chatbots, enabling the development of models capable of understanding and generating human language with unprecedented accuracy. The introduction of recurrent neural networks (RNNs) and long short-term memory (LSTM) networks addressed the challenge of maintaining context in conversations, allowing chatbots to handle longer and more complex interactions. The work of researchers like Yoshua Bengio and Geoffrey Hinton has been instrumental in advancing these techniques.

IEEE paper published by authors Sasha Fathima Suhel; Vinod Kumar Shukla; Sonali Vyas; Ved[23] Prakash Mishra titled "Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language" in which they

have concluded the expansion of the domain. Intelligent answers created by entering not only the current FAQ list, but also various other outlets such as twitter, servers, and other data sources. Providing suggestions for closure. Intelligent response photo example, links. Merging linguistic similarity together with cosine similarity. Data relevant to the reporting account using the integrated system of the Bank.

IEEE paper published by authors Gomathy B; Krishna Kumar S; Mukilan R; Naveen Balaji R titled "Voice recognition bot for internet banking" in which they have concluded the attention decoder is based on the ANN and is implemented with the framework language model. Our preliminary results show that it can generate simple and basic conversations and extract knowledge from a trained dataset. The bot can be able to train more datasets if wanted. The bot can now respond to all queries about banking accounts and industrial details.

IEEE paper published by authors Ajmeera Kiran, I. Jeya Kumar, P. Vijayakarthik, S.K Lokesh Naik and T. Vinod titled "Intelligent Chat Bots: An AI Based Chatbot For Better Banking Applications" in which they have concluded the world of digital technology is rapidly incorporating chatbots into its fabric. It is essential for the demands of the consumer to be met, and it is the responsibility of the business to fulfill the requirements of the client. The ever-increasing pace of technology advancement is leading to higher customer expectations. Businesses and other types of organizations place a significant emphasis on achieving high levels of customer satisfaction for the simple reason that clients who are unhappy with the services they receive rarely come back. A chatbot is a term used to refer to a piece of software that can simulate human conversation. They listen carefully, and their responses are always well thought out. There are

currently available digital assistants that can be triggered via speech, in addition to chatbots that can be engaged via voice or text. Bots can behave differently depending on the manner in which[35] artificial intelligence is implemented on the backend. This makes it possible for businesses to provide clients more[36] than just straightforward logical solutions. Chat software, which frequently gives the impression that only one person is participating in the conversation, is considered to be inferior to chatbots. Chatbots are more conversational in nature,[37] whereas digital or intelligent assistants go beyond the capabilities of chatbots to carry out actions that are helpful to the user. When it comes to the self-service choices that banks offer, the vast majority of customers go into the experience with extremely low expectations because these options are typically subpar. The customer must regularly call the call center in order to[38] complete the self-service transactions.

IEEE paper published by authors Charu Saxena, Pardeep Kumar, Rakesh Sarvaiya and[39] Bhanupriya Khatri titled "Attitude, Behavioral Intention and Adoption of AI Driven[40] Chatbots in the Banking Sector" in which they have concluded the assurance of a trustworthy system and ease of use can influence BI among users towards the adoption of chatbots in banking. The facilitating conditions of banks, which include organizational and technological infrastructure, can enhance behavioral intention to use chatbots for customer services, which leads to adoption[41] of AI-driven chatbots in banks. Subjective norms play another important role in creating positive beliefs and attitudes among users of technology in banks. With the support of organizations and technical infrastructure, artificial intelligence-based chatbots can be successful in providing quality customer services and enhance[42] customer satisfaction. The positive attitude and BI towards the usage of chatbot[43] in

banking, in turn, leads to the adoption of the technology to fulfill the needs of customers.

Proposed system

fig 1. Flow diagram for Bank Info Bot

The users basically can query via 4 different routes:

DialogFlow Admin Panel

DialogFlow Web Demo

Messenger

Telegram

DialogFlow Admin Panel and DialogFlow Web Demo has fully text based entries like for instance, initially if a user queries "Hey" or "Hello", the chatbot will reply back with "Welcome to Bank Info Bot! Please enter IFSC Code (eg: UTIB0003785) for Bank Information or simply type "No IFSC" or "I do not have

ifsc code" if you don't have IFSC Code.". Based on this the user can type IFSC code directly or else can seek the "No IFSC" option.

If the user routes to the "No IFSC" option the chatbot will reply with "No issues!!! Please enter the Bank Name and Area Name to get Bank Information (eg: Axis Bank in Vikhroli area) or type "list banks" to know banks present in a particular area.". Based on this the user can type Bank Name and Area name directly or else can seek the "List Banks" option.

Messenger and Telegram have option based and text based entries like for instance, initially if a user queries "Hey" or "Hello", the chatbot will reply back with "Welcome to Bank Info Bot! Please select any one option". And then we have 3 buttons "IFSC Search", "Bank Search" and "List Banks" and the user has to click any one button.

IFSC Search

This option is for the users who have the bank IFSC Code and they can use them to get the information of Banks.

Bank Search

This option is for the users who do not have the bank IFSC Code, so they enter Bank Name and Area Name to get the information of Banks in a particular area and from there they can IFSC Code which can be used for IFSC Search.

List Banks

This option is for the users who need to list all banks in a particular area.

Technologies used

As shown in the above model i.e fig 1, User can query chatbot using:

Visual Studio Code

Github

Python

FastApi

BeautifulSoup

DialogFlow

Telegram

MongoDB

Conclusion

By using the Bank Info Bot, users can effortlessly obtain detailed bank information in a structured and efficient manner. This powerful tool is designed to streamline the process of accessing crucial banking details, making it an invaluable resource for both individuals and organizations. The bot can seamlessly integrate with a wide range of applications and platforms, enhancing its versatility and usability across different environments. One of the key advantages of the Bank Info Bot is its ability to provide real-time information. Whether users need to look up branch addresses, IFSC codes, SWIFT codes, or other essential banking details, the bot ensures that the information is up-to-date and accurate. This reduces the risk of errors and enhances the reliability of the data being accessed.

The integration capabilities of the Bank Info Bot are particularly noteworthy. It can be embedded into various messaging platforms such as Telegram, Slack, Messenger, LINE, and more. This flexibility allows organizations to deploy the bot within the communication tools they are already using, facilitating smoother workflows and better user experiences. Furthermore, the Bank Info Bot can be customized to fit the specific needs of different organizations. Customization options include setting up predefined queries, configuring response formats, and integrating with internal databases or systems. This adaptability ensures that the bot can cater to various use cases, from simple information retrieval to more complex financial operations.

Overall, the Bank Info Bot is a comprehensive solution that transforms how banking information is accessed and utilized. Its real-time data provision, integration flexibility, customization options, and robust security measures

make it an essential tool for modern organizations. By adopting the Bank Info Bot, organizations can improve efficiency, ensure data accuracy, and enhance user experience across multiple platforms and applications, ultimately leading to better-informed decisions and more streamlined operations.

References

IEEE Paper titled "Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language": https://ieeexplore.ieee.org/document/9197825

IEEE Paper titled "Voice recognition bot for internet banking"[62]: https://ieeexplore.ieee.org/document/9782235

IEEE Paper titled "Intelligent Chat Bots: An AI Based Chatbot For Better Banking Applications"[63]: https://ieeexplore.ieee.org/document/10128582

IEEE Paper titled "Attitude, Behavioral Intention and Adoption of AI Driven Chatbots in the Banking Sector"[64]:

https://ieeexplore.ieee.org/document/10150155

MongoDB: https://www.mongodb.com/try/download/community

Web scrape website 1: https://ifsc.bankifsccode.com

Web scrape website 2: https://www.askbankifsccode.com

BeautifulSoup: https://pypi.org/project/beautifulsoup4/

FastApi: https://fastapi.tiangolo.com/

DialogFlow: https://cloud.google.com/dialogflow

Telegram: https://web.telegram.org/

Python: https://www.python.org/

1.	~~DialogFlow~~ → Dialogflow	Misspelled words	Correctness
2.	~~DialogFlow~~ → Dialogflow	Misspelled words	Correctness
3.	~~original~~	Wordy sentences	Clarity
4.	~~of academic~~ → of academic	Improper formatting	Correctness
5.	~~integrity and~~ → integrity and	Improper formatting	Correctness
6.	~~and have~~ → and have	Improper formatting	Correctness
7.	~~have not~~ → have not	Improper formatting	Correctness
8.	not misrepresented	Improper formatting	Correctness
9.	~~or~~	Conjunction use	Correctness
10.	~~which have~~ → that have	Pronoun use	Correctness
11.	and MongoDB	Conjunction use	Correctness
12.	~~in~~ → on	Wrong or missing prepositions	Correctness
13.	the Bank	Determiner use (a/an/the/this, etc.)	Correctness
14.	, and	Comma misuse within clauses	Correctness
15.	, and	Comma misuse within clauses	Correctness
16.	the chatbot	Determiner use (a/an/the/this, etc.)	Correctness
17.	the Web	Determiner use (a/an/the/this, etc.)	Correctness
18.	, Dialogflow	Improper formatting	Correctness
19.	, and	Comma misuse within clauses	Correctness

20.	, and	Comma misuse within clauses	Correctness
21.	~~id's~~ → IDs	Incorrect noun number	Correctness
22.	~~time consuming~~ → time-consuming	Misspelled words	Correctness
23.	and Ved	Conjunction use	Correctness
24.	are created	Incorrect verb forms	Correctness
25.	~~twitter~~ → Twitter	Confused words	Correctness
26.	~~together~~	Wordy sentences	Clarity
27.	~~B~~ → B.	Confused words	Correctness
28.	~~R~~ → R.	Confused words	Correctness
29.	and Naveen	Conjunction use	Correctness
30.	~~R~~ → R.	Confused words	Correctness
31.	Internet Banking	Confused words	Correctness
32.	~~have~~	Incorrect verb forms	Correctness
33.	, and	Comma misuse within clauses	Correctness
34.	The demands of the consumer need to be	Wordy sentences	Clarity
35.	~~the manner in which~~ → how	Wordy sentences	Clarity
36.	with more	Wrong or missing prepositions	Correctness
37.	~~in nature~~	Wordy sentences	Clarity
38.	~~in order to~~ → to	Wordy sentences	Clarity

39.	, and	Comma misuse within clauses	Correctness
40.	~~AI-Driven~~ → AI-Driven	Misspelled words	Correctness
41.	the adoption	Determiner use (a/an/the/this, etc.)	Correctness
42.	~~enhance~~ → enhancing	Incorrect verb forms	Correctness
43.	~~chatbot~~ → chatbots	Incorrect noun number	Correctness
44.	~~has~~ → have	Faulty subject-verb agreement	Correctness
45.	~~text based~~ → text-based	Misspelled words	Correctness
46.	~~like~~	Wrong or missing prepositions	Correctness
47.	~~back~~	Wordy sentences	Clarity
48.	the IFSC	Determiner use (a/an/the/this, etc.)	Correctness
49.	~~ifse~~ → IFSC	Confused words	Correctness
50.	an IFSC	Determiner use (a/an/the/this, etc.)	Correctness
51.	the Vikhroli	Determiner use (a/an/the/this, etc.)	Correctness
52.	the Bank	Determiner use (a/an/the/this, etc.)	Correctness
53.	~~option based~~ → option-based	Misspelled words	Correctness
54.	~~text based~~ → text-based	Misspelled words	Correctness
55.	~~like~~	Wrong or missing prepositions	Correctness
56.	~~back~~	Wordy sentences	Clarity

57.	their Bank	Pronoun use	Correctness
58.	, and	Comma misuse within clauses	Correctness
59.	the User	Determiner use (a/an/the/this, etc.)	Correctness
60.	the chatbot	Determiner use (a/an/the/this, etc.)	Correctness
61.	the:	Determiner use (a/an/the/this, etc.)	Correctness
62.	~~internet~~ → Internet	Confused words	Correctness
63.	~~AI Based~~ → AI-Based	Misspelled words	Correctness
64.	~~AI Driven~~ → AI-Driven	Misspelled words	Correctness