

Empowering Financial Peace through Chatbot Guidance

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Abstract: Real-time conversations with humans can be held by intelligent chatbots, utilized by businesses to enhance customer service and streamline operations. A gap is perceived in existing chatbots' achievement of human-like conversational abilities, despite their widespread acceptance and implementation across various sectors. This research paper discusses the development of a unique chatbot providing not only financial guidance but also emotional support, thus sparking a blend of technological innovation and human connection. Emotional states of users are deciphered by the chatbot, using natural language processing (NLP) and sentiment analysis. Tailored responses are generated, offering practical financial advice as well as emotional support during times of stress. Aiming to empower users in managing their financial challenges with serenity, the chatbot integrates emotional support, financial education, goal setting and planning, stress management, and continuous support and monitoring. Cutting-edge technologies, including the Python programming language and NLP libraries like spaCy and NLTK, are incorporated in the project. It interfaces with external financial APIs to provide real-time data enabling informed decision-making. Our chatbot's focus lies in providing a secure and positive environment for users to share financial worries, with the unique ability to comprehend and respond to financial inquiries and emotional nuances in users' messages. By documenting the creation of this chatbot, a contribution is made to the expanding field of emotional intelligence in artificial intelligence applications. The expected outcomes of this research project include an enhanced sense of financial well-being for users, bridging the gap between technological solutions and human-centered support

Keywords: Natural Language Processing(NLP),Financial Chatbot, Sentiment Analysis, Virtual Companion, Financial Assistance.

I. INTRODUCTION

The rapid evolution of the digital sphere, with technology and human experience redefining traditional paradigms, places the financial sector at the heart of transformation. A surge in technological innovations points to the need to humanize financial services, especially for those grappling with heavy loans. This text discusses the pioneering project "Empowering Financial Peace through Chatbot Guidance," an ambitious initiative aimed at transforming the way individuals manage substantial financial burdens.

Today's financial landscape is characterised by pervasive heavy loans and escalating economic pressures, intensified by global uncertainties. Traditional financial institutions offer solutions rooted in numbers and algorithms, neglecting the emotional toll of financial stress. The convergence of financial technology and artificial intelligence presents an opportunity to bridge this gap, providing users with a virtual companion armed with emotional intelligence.

The project recognizes that financial well-being encompasses both quantitative and qualitative aspects. The traditional approach to providing financial guidance fails to consider the emotional complexities associated with managing large loans. To address this, our research focuses on the development of a chatbot capable of understanding and responding to users' emotional states in real-time.

The aim is to foster a symbiotic relationship between technology and empathy, enabling users to interact with a virtual companion that offers financial guidance and emotional support. By combining emotional aid and financial expertise, our chatbot transcends the boundaries of conventional financial aid.

The project objectives include emotional support, financial education, goal setting and planning, stress management, as well as continuous support and monitoring. This holistic approach recognises that financial well-being encompasses psychological and emotional dimensions of individuals' lives.

Technologically, the project utilizes the Rasa chatbot framework, Python programming language, and sophisticated natural language processing libraries such as spaCy and NLTK. Integration of external financial APIs provides real-time data, enabling users to make informed financial decisions.

User-centric design and security are critical in the chatbot development. The project aims to create a secure and welcoming space for users to express their financial concerns, and foster trust and engagement. The chatbot's unique ability to understand and respond to emotional nuances in user messages makes it a unique addition to the evolving landscape of artificial intelligence.

As we explore the creation of a financially savvy and emotionally intelligent chatbot, this paper documents the journey, challenges, and outcomes of our innovative project. We aim to contribute to the discourse on the intersection of technology and emotional well-being, providing users with a transformative experience, and empowering them to navigate financial challenges with serenity.

II. LITERATURE SURVEY

The essential focal point of the review [1] fixates on the improvement of a modified monetary counsel talk bot through the use of the Message stage. The goal of the exploration is to create a product item that conveys customized monetary direction and helps possible financial backers in distributing their capital. The creators put accentuation on the execution of human plan in visit bots to improve human discernment and cooperation. Moreover, they contrast different methodologies with building courier bots, highlighting the meaning of brief and explicit reactions for clients looking for monetary counsel. The examination approach includes the usage of scientific numerical strategies and innovations, for example, Python, Wire Bot Programming interface, Aiogram, Docker, Amazon Web Administrations, EC2, and Ubuntu Server. The creators continue to foster their own product item, a Wire talk bot, by examining existing programming answers for monetary counsels and building an intricate layout for message handling and estimations. The bot is housed on Amazon Web Administrations - EC2, working on the Ubuntu Server framework, and conveyed utilizing a Docker holder. With everything taken into account, the paper presents an extensive technique for making a customized monetary exhortation visit bot and offers bits of knowledge into the philosophy and innovations utilized in the interim.

The paper [2] conveys a writing survey relating to the reconciliation of the capacity to understand people on a profound level into chatbots with the end goal of sympathy and backing. The assessed papers overwhelmingly use the grouping to-arrangement (seq2seq) model structure, close by other plan strategies, to upgrade the seq2seq model. Plan strategies embraced by the inspected papers incorporate contingent variational auto-encoder, transformers, and different techniques. The writing survey integrates assorted kinds of datasets for trial and error. Huge progressions in the advancement of genuinely astute text-based chatbots include the usage of Seq2seq, transformers, Long-Momentary Memory (LSTM), Convolutional Brain Organization (CNN), Restrictive Variational Auto-Encoder (CVAE), Full of feeling dictionary, Repetitive Brain Organization (RNN), Variational Repetitive Brain Organization (VRNN), and other state of the art advances. The record means to help specialists in appreciating the relationship between's genuinely canny chatbots and client fulfillment, as well as recognizing regions for development.

The paper intends to address the money related difficulties looked by UNIKOM students, as monetary arrangement status and supervising individual spending plans, by using a chatbot as an instrument for financial organization. The makers use the Customary Language Dealing with approach, expressly the Text Mining procedure, to make the chatbot. The structure [3] is taken a stab at using disclosure testing and beta testing, and the results show that the chatbot can give money related information and work with the recording and the leading group of individual spending plans for UNIKOM students. The paper moreover makes reference to the use of data arrangement systems, for instance, reviews and composing studies, and the item improvement procedure used is the fountain technique. As a general rule, the survey shows the practicality of using a chatbot for individual financial organization, giving solace and help to UNIKOM students in managing their assets.

According to investigate paper [4] presents a free application for stress the leaders and assumption. The application utilizes mind associations and artificial intelligence methodologies, for instance, decision trees to get ready data and

definitively expect sensations of nervousness considering client input. Clients can grant their tension related issues to the application, which then, gives appropriate measures to manage the strain. The paper means to cultivate an end client support and meeting project that can be embedded in destinations or phone applications. It moreover discusses the meaning of recognizing sensations of tension and executing strong strain the board procedures.

Maker addresses [5] the meaning of mental success during the pandemic and the reluctance of individuals to discuss their close to home prosperity issues with others, provoking extended pressure and lessened effectiveness in work. To address this, the makers propose the use of a Treatment Chatbot that grants clients to examine their considerations without the sensation of fear toward judgment, subsequently diminishing passings as a result of misery. The chatbot application involves oversaw sorting out some way to make responses considering client text, perceiving watchwords and answering in like manner. The hypothetical encounters pre-demand answers set aside in an informational index, and the words or sentences are taken care of by secluding them into individual words and discarding complement. The chatbot is arranged as an application and the dialogFlow objective is related with the sway application to make the chatbot.

The paper gives a framework of chatbots and revolves around [6] research designs as for the improvement of human-like chatbots prepared for closing the mechanical opening in the business. The makers kept an eye on composing disseminated from 1998 to 2018 and presented a blueprint of chatbots using a mind map approach. The mind arranging procedure was chosen to envision the associations between different thoughts in a fundamental, visual construction. The paper includes that chatbots work in three phases: understanding customary language input, making relevant responses, and building reasonable and natural typical language responses. The continuous bottleneck in arranging misleadingly savvy chatbots lies in the business' shortfall of normal language taking care of limits, which hinders the chatbot's ability to make critical responses. The paper focuses on the meaning of understanding the continuous execution techniques and uses of chatbots, especially for client support and as wise distant partners.

The paper [7] is about execution of a PC based knowledge chatbot in client support at PT. FinAccel Cash Indonesia. It uses a realistic emotional system, including gatherings and composing studies, to get a handle on the kind of execution and the impacts on help quality. The survey uses SWOT assessment as a framework organizing strategy and stresses the meaning of internal and external factors in decisive reasoning. The makers discuss the advantages and hindrances of chatbots in client care and give thoughts to PT. FinAccel Cash Indonesia considering the disclosures. The paper moreover includes expected troubles, for instance, structure bugs and bumbles during execution. By and large, it means to additionally foster client care through the strong use of computerized reasoning chatbots.

The paper [8] presents the execution of a chatbot structure using reproduced insight and NLP computations to make a conversational UI for programming applications. The chatbot structure is expressly planned to further develop the client experience on a school site by giving speedy and instructive responses to questions associated with various school works out, for instance, evaluation cell, affirmation, scholastics, support, grade point typical, and circumstance cell. The structure utilizes procedures like watchword extraction, lemmatization, and POS naming to analyze and fathom client questions, ensuring definite and pertinent responses. Besides, the system keeps a log record to follow unanswered requests, allowing the director to add relevant responses to the data base and further foster the chatbot's data structure for a really long time.

The paper [9] gives an escalated assessment of the chatbot advancement environment, focusing in on its arrangement of encounters, difficulties, and responsibility. It presents a versatile chatbot structure that uses support learning methods, assessment, and ordinary language dealing with to additionally foster client correspondences and conversational experiences. The chatbot has different significant properties, including voice-to-voice conversation, multilingual assistance, abilities to incite, disengaged working, and fast help features. The audit explores the multifaceted nature of chatbot development progression and its broad ramifications for different regions. It highlights three fundamental parts: sorting out stand-out purchaser tendencies, reenacting clients' certified experiences, and chipping away at the cutoff concerning assumption using dynamic satisfaction assessments. The paper focuses on the meaning of reliable chatbot creation, discussing moral issues like inclination and security. It reasons that chatbots redesign client care, relationship quality, and client commitment, with an accentuation on their importance in the assurance business.

The paper analyzes [10] the impact of GPT-4 and its application, Copilot, on academic assessment in the cash and accounting fields. GPT-4 is shown to have overwhelming capacities, achieving high scores on researcher and master

tests and having the choice to accomplish dreary office work. The quick spread of GPT-4's applications across various areas of society is included. Sensible models are given to show GPT-4's feasibility in feeling assessment, ESG examination, corporate culture assessment, and National bank evaluation examination. The paper proposes instructive recommendations for applying GPT-4 in these parts of information. The use of GPT-4 for text based assessment in financial investigation is shown through models like assessment examination, ESG examination, corporate culture assessment, and assessment of National bank minutes.

Chatbots [11] regularly alluded to as conversational connection points, give clients a clever method for interfacing with PCs. In the customary situation, settling routine questions required human mediation, forcing impediments like time imperatives and reliance on the particular information on the person. Nonetheless, the coming of chatbot frameworks has changed this experience, offering the goal of inquiries much the same as human help yet without the ordinary imperatives. Various organizations have embraced this innovation, fostering their own chatbots to help clients with different necessities. Our particular chatbot centers around monetary administrations, having some expertise in loaning and home loan administrations.

Given the new accentuation on further developing client touchpoints, organizations find it pivotal to distinguish difficulties, frame arrangements, and lay out clear targets for steady improvements. Thusly, many undertakings are embracing [12] "chatbots" to mechanize PC intervened correspondence as a help for drawing in with clients. This pattern is perceptible in the monetary business, managing a range of many-sided items and administrations, where chatbots are progressively utilized for client care and deals. Fujitsu has developed the FUJITSU Monetary Administrations Arrangement Finplex Robot Specialist Stage (FRAP), an artificial intelligence controlled endeavorchatbot administration. FRAP works with computerized robot help with monetary item deals and client assistance through visit based cooperations, utilizing AI gained information. This report at first examines patterns in big business chatbot administrations and their applications in business. Hence, it dives into a contextual investigation of FRAP's execution at Sony Bank Inc., featuring its unmistakable elements.

Teacher YoshuaBengio [13], 2019 Turing Grant champ, countered Teacher Carl Benedict Frey's forecast on computer based intelligence wiping out monetary positions. Bengioreferred to simulated intelligence's job in advanced change, changing jobs as opposed to killing position. Chatbots, exemplified by Siri, Alexa, and Bixby, grandstand computer based intelligence's wide arrangement. The review analyzes computer based intelligence's effect on the monetary area, tending to confusions and the requirement for orderly analysis. It looks at client care channels (ARS versus chatbots) in banks, breaking down their impacts on benefits. Area 2 surveys earlier exploration on monetary chatbots, client support difficulties, innovation presentation, and bank pointers. Segment 3 lays out speculations and behaviors factual examination on bank information. Area 4 assesses hypothetical underpinnings utilizing information and closes with suggestions and future examination plans.

Innovation progressions drive cell phone market interest, developing fundamentally in ongoing a long time with the ascent of shrewd elements. [14] Man-made reasoning (computer based intelligence), outstandingly chatbots, assumes a pivotal part in supplanting conventional techniques across different areas like training, money, and associations. Chatbots, artificial intelligence fueled conversational specialists, utilize Normal Language Handling (NLP) to appreciate and examine human language, working with simple cooperations. NLP, established in man-made intelligence, software engineering, and etymology, upgrades correspondence among PCs and clients. Chatbots store etymological information for successful sentence structure acknowledgment. They go about as correspondence test systems, answering client questions in a direct way. Exchange frameworks, including conversational specialists like chatbots and Intelligent Voice Reaction (IVR), span normal language correspondence among clients and computerized applications.

Progressions in innovation [15] have moved PC cooperation from order lines to computer based intelligence driven interfaces like chatbots. These bots, using man-made intelligence, AI, and regular language handling, upgrade correspondence through discourse and text structures. Chatbots, pivotal in advancing innovation, offer effective relational collaborations, learning capacities, and wide-arriving at mechanized informing. The monetary area progressively takes on chatbots for information driven direction, profiting from their capacity to deal with routine assignments and decrease costs. Research in this space centers around conversational and specialized angles, security, client discernments, and administrative encounters. In any case, there's an exploration hole in understanding discussion

determinants and specialized difficulties, provoking a precise writing survey. This article intends to order determinants, address holes, and act as an asset for the monetary area. Segments incorporate related articles, procedure, information blend, synopsis, and ends with future exploration ideas.

There [16] is a developing interest in the usage of chatbots as a vital innovation for computerized change inside the monetary business. In spite of broad examination zeroing in on the viewpoints of clients and designers, there is a recognizable hole in looking at chatbot administrations from the stance of supervisors, who hold a vital job in the hierarchical reception of chatbots. This paper means to dig into administrators' view of chatbots, revealing insight into the commencement of monetary chatbots and offering experiences into their future in South Korea, where monetary firms effectively utilize chatbots. Through leading semi-organized interviews with chiefs liable for chatbot administrations in Korean monetary establishments, we utilized a center outskirts examination of social portrayals. Our discoveries expect to advance the perception of the present status of chatbot administrations in the Korean monetary industry, offering both hypothetical ramifications and administrative bits of knowledge.

Computerized reasoning (artificial intelligence) [17] assumes an undeniably essential part in our regular routines, appeared through astute specialists - programming and equipment intended for different undertakings. Chatbots embody simulated intelligence frameworks, displaying basic Human-PC Cooperation (HCI). These PC programs mimic human-like discussion through text or voice, utilizing Normal Language Handling (NLP). Chatbots track down application in training, data recovery, business, and online business. Their notoriety emerges from stage freedom, simple availability, and mix with informing applications. They offer benefits, for example, personality check, secure installment administrations, and re-commitment systems. For engineers, chatbots offer correspondence unwavering quality, fast improvement emphases, and straightforwardness in interface plan. The paper digs into the set of experiences, research interest, issues, ideas, grouping, engineering, and driving foundation of chatbots, closing with future exploration possibilities.

"Parsing the Turing Test" [18] is a critical assessment of the philosophical and systemic contemplations in the journey for legitimate man-made consciousness. The focal request spins around whether PCs and robots can imitate human idea and correspondence. Hypotheses incorporate the possibility of reluctant machines entering the Web to frame a World Brain and whether keen PCs could ultimately perceive the seemingly problematic insight of people. Regarded experts in brain research, software engineering, reasoning, and programming take part in a worldwide talk on these significant inquiries, molding the story on the eventual fate of humankind. The foreword is written by Daniel C. Dennett.

In the space of different clinical treatments [19], the overflow of data relating to drugs and sicknesses presents an imposing deterrent for people looking for far reaching information. The current hole highlights the need for a concentrated stage that offers admittance to itemized data in regards to sicknesses, meds, and their fitting use. Imagine a space wherein the contribution of side effects or the checking of an electrocardiogram yields experiences into medical problems or confirms the planned utilization of endorsed meds. The proposed arrangement involves the execution of a computerized reasoning framework invested with the capacity to foresee infections in view of side effects and outfit a complete exhibit of accessible medicines. Moreover, the framework would supply data with respect to medicine organization and suggested applications, in this way enabling people to settle on informed choices in regards to their medical services. This inventive methodology tries to increase's comprehension people might interpret their prosperity, consequently empowering them to embrace the most appropriate game-plan for their government assistance.

The article [20] inspects the remarkable expansion of chatbots, with a stunning count of north of 100,000 on Facebook Courier by April 2017, and an extended yearly worldwide income of up to \$32 billion. It highlights the double effect of chatbots, which involves both income age and cost decrease, with expected compensation reserve funds across different areas. The exploration focuses on chatbots inside the domain of public transportation, isolating the conversation into four unmistakable segments. It characterizes chatbots, portrays their benefits and difficulties, and presents research discoveries got from studies directed with clients and test clients of a model chatbot. The discoveries dive into inclinations, propensities, and encounters connected with public transportation, coming full circle in significant bits of knowledge relating to novel open doors for strategically pitching and up-selling attempts.

III. PROPOSED METHODOLOGY

The proposed methodology, as illustrated in Fig. 1, encompasses a series of steps which depicts the steps taken to a user-friendly and smooth interaction with the financial chatbot.

Step 1: Requirement Analysis.

Analysis of user needs, financial situations and their specific challenges.

Step 2: Technology used

Using the appropriate chatbot framework, NLP tools like tensorflow and frontend development tools based on the project requirements and goals.

Step 3: Feature Definition.

Define features for each financial situations by considering the aspects like budgeting, debt management, Investment guidance and empathetic responses.

Step 4: Data Collection and Dataset Preparation.

Gather all relevant financial data and consider all the financial scenarios a user may encounter, to train the chatbot. Then preprocess the gathered data to train the model accurately.

Step 5: Model Training and Development.

Train the chatbot model, using specific intents, stories and actions. Using of NLP tools, which facilitates advanced language understanding.

Step 6: User Interface Development.

Implement a user-friendly interface by using HTML, CSS and JavaScript. Integrate the chatbot with the frontend design which enables a smooth user experience.

Step 7: Security measures and Privacy.

To protect the sensitive financial data of users, incorporate appropriate encryption protocols. Also implement user authentication and authorization mechanisms.

Step 8: User Testing.

Test the chatbot to evaluate its performance, user-experience and overall user satisfaction. Collect feedback from the users regarding the chatbot's responses.

Step 9: Continuous Improvement.

Continuously analyse the feedback given by the user and appropriately make improvements to chatbot's responses for refining the chatbot.

IV. BLOCK DIAGRAM

The block diagram visually represents the sequential flow of the proposed methodology. It starts with requirement analysis, followed by data collection about user's financial situations. The collected data is then preprocessed and is used for training the chatbot model. The user interface is then integrated with the trained chatbot model. The security measures are implemented to ensure data privacy. The model is dynamic which continuously improves or changes based on user feedback.

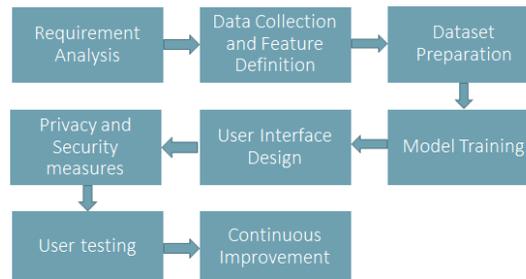


FIG .1

V. CONCLUSION

In conclusion, this financial and emotional support chatbot represents a chatbot that uses both technology and empathy to support users with heavy loans and financial stress problems. By incorporating emotional aspect with the financial advice, this chatbot guides user in financial difficulties, comforting them by understanding that financial situations can be stressful sometimes. It transforms the user's journey of financial burdens and hardships into a more positive journey.

The core aspects of the project lies on the fact that financial situation can disrupt user's emotional and mental health. The chatbot assumes a dual role as both financial adviser and empathetic listening bot. This proposed method goes beyond traditional financial assistance, which does not take user's emotional health into account. It ensures the right balance between objectivity and empathy which delivers a valuable guidance to the users.

It also ensures privacy of user's financial data that the user may share during the interaction process. This handling of data requires a robust security measures to prevent unintended consequences and maintains user trust.

By integrating external API's it brings the capability to deliver real-time and accurate financial data, which maybe crucial for making decisions.

The dynamism that the project provides is based on user feedback, which makes room for continuous improvement for the chatbot's success. This ability to continuously improve based on user interaction, helps chatbot give more relevant and effective responses to user queries.

Finally, this chatbot provides support to individuals with heavy loans and financial stress ,by not only providing algorithmic financial advice, but also by providing an understanding and empathetic responses based on financial situations. The project contributes to the applications of Artificial Intelligence where a chatbot will be used for financial peace. The project represents a realm where technology and human emotions meet.

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