CapitaWise

Revolutionize Bank Customer Services

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Introduction

Banking services, by their very nature, are intricate and complicated. Traditional customer service approaches, including current chatbot solutions, often fall short. Existing chatbots tend to be mechanical and lack the depth of information necessary to provide meaningful assistance. Moreover, they are generally unable to perform operations that require permissions, limiting their effectiveness.

In response to these challenges, we propose the development of a revolutionary chatbot, CapitaWise, powered by advanced Large Language Models (LLMs). CapitaWise will be capable of accurately answering any banking-related questions, drawing on verified and referenced information. It will go beyond mere information dissemination by addressing user problems directly and efficiently.

CapitalWise promises to streamline user interactions within banking apps, significantly enhancing the user experience. For the banks, the implementation of such a chatbot will result in substantial savings on customer service costs. By automating complex inquiries and operations, banks can reallocate resources to other critical areas.

In essence, CapitaWise has the potential to revolutionize the banking app experience, making it more user-friendly and cost-effective.

Problem Statement:

Flaws of Services/Difficult to Use

Current banking services and chatbots are often cumbersome and not user-friendly. Customers face difficulties in navigating through options and finding relevant information quickly. This leads to a frustrating experience and a lack of trust in digital banking solutions.

High Resistance

There is significant resistance from customers when it comes to using digital banking services, primarily due to their complexity and the lack of intuitive assistance. Many users prefer speaking to a human agent rather than using a bot that might not understand their needs.

Language Barriers

Many existing chatbots lack multilingual support, limiting their usability for non-English speaking customers. This creates a barrier for a large segment of the customer base, reducing the overall effectiveness of digital banking solutions.

Don't Solve Problems

Existing chatbots often fail to solve complex problems or provide actionable solutions. They can give generic responses but lack the capability to perform specific operations that require in-depth understanding and permissions.

Project Overview

Objective

The primary objective of CapitaWise is to enhance the customer service experience in banking by providing an intelligent, responsive, and user-friendly chatbot. This will involve accurately answering banking-related questions, performing operations requiring permissions, and improving overall customer satisfaction.

Why AI

Leveraging AI, specifically advanced LLMs, enables CapitaWise to understand and process complex queries, maintain context in multi-turn conversations, and provide personalized responses. AI allows for continuous learning and improvement, ensuring the chatbot evolves with user needs and technological advancements.

Scope

The scope of CapitaWise includes the development of a chatbot that integrates seamlessly with existing banking apps, supports multiple languages, provides personalized banking assistance, and performs complex operations securely.

Target Audience

CapitaWise targets both individual banking customers and financial institutions. For customers, it aims to provide a seamless and efficient banking experience. For banks, it offers a cost-effective solution to improve customer service and operational efficiency.

Solution and Features

CapitaWise will offer a range of features including:

- Advanced NLP capabilities for understanding complex queries.
- Contextual awareness for multi-turn conversations.
- Personalized recommendations and advice.
- Proactive assistance and alerts.
- Integration with bank systems for real-time data access.
- Enhanced security features for safe transactions.

Use Cases & Key Features

1. Balance Inquiry:
    - Customers can quickly check their balance and transaction history.
    - The chatbot provides detailed responses and links to account statements.
2. Credit Card Applications:
    - Guides users through the application process.
    - Offers personalized recommendations based on the user's credit profile.
3. Fraud Detection:
    - Assists in identifying and reporting fraudulent transactions.
    - Can freeze accounts and escalate issues to human agents.
4. Financial Advice:
    - Provides personalized financial planning and budgeting advice.
    - Helps users set and track savings goals.
5. Loan Inquiries:
    - Answers questions about loan products and eligibility.
    - Assists in the application process and tracks application status.

Architecture and Design

System Architecture

The architecture of our voice-enabled chatbot for Chase Bank is designed to provide a seamless and efficient user experience by integrating various cutting-edge technologies. The system is modular and scalable, ensuring high performance and security.

Components

Frontend:

- Technologies Used: HTML, CSS, JavaScript, SwiftUI.
- Functionality: Handles user interactions, captures voice input, and displays text and voice responses.
    - Elements:
        - Chat Interface: index.html for text/voice interactions.
        - Styles: styles.css for responsive, visually appealing UI.
        - Scripts: scripts.js for chat management, voice recognition, and API calls.

Backend:

- Technologies Used: Flask, OpenAI GPT-4.
- Functionality: Processes API requests, interacts with OpenAI GPT-4 to generate responses, and manages application logic.
    - Files:
        - app.py: Main Flask application file for routes and API handling.
        - gpt.py: Module for interacting with OpenAI GPT-4.

Speech Processing:

- Speech-to-Text: Web Speech API converts spoken input to text.

Database:

- Functionality: Stores user interactions, preferences, and session data for personalized experiences and conversation context.

Workflow

1. User Interaction: Users interact with the chatbot via text input or voice commands.
2. Speech Recognition: Voice commands are captured and converted to text using the Web Speech API.
3. Request Handling: The frontend sends user queries to the backend server via API calls.
4. Response Generation: The backend processes the queries using the OpenAI GPT-4o model and retrieves the appropriate responses.
5. User Feedback: Responses are sent back to the frontend and delivered to the user either as text or speech.

Role of AI and Machine Learning

The core of our system is powered by OpenAI's GPT-4o, a SOTA language model capable of understanding and generating human-like text. Key features include:

- Natural Language Understanding (NLU): The model comprehends user queries with high accuracy.
- Response Generation: It generates contextually appropriate and informative responses.
- Personalization: The model adapts to user preferences over time for a more personalized experience.

Integration with Chase Bank's Existing Systems

Integration with Chase Bank's systems is crucial for providing accurate and up-to-date information. This includes:

- Account Management APIs: Securely accessing user account information, transaction history, and other relevant data.
- Customer Support Systems: Integrating with existing customer support platforms to provide a seamless handover when needed.
- Security Protocols: Ensuring all data transactions are encrypted and comply with banking industry standards.

Security and Data Privacy Measures

Given the sensitive nature of financial data, our architecture incorporates robust security measures:

- Encryption: All data in transit and at rest is encrypted using industry-standard protocols.
- Authentication and Authorization: Multi-factor authentication (MFA) and role-based access control (RBAC) are implemented to ensure that only authorized users can access sensitive information.
- Compliance: The system complies with all relevant regulations, such as GDPR, CCPA, and PCI-DSS, to ensure data privacy and security.

Revenue Model

Our revenue model is designed to monetize the AI-driven customer service chatbot for financial institutions while providing substantial value to both large banking institutions and their customers. This model is structured to ensure flexibility, scalability, and significant cost savings. Here’s a detailed breakdown:

Service Offering

AI-driven customer service chatbot for financial institutions.

Market Focus

Large banking institutions across the US, with the potential to scale globally.

Pricing Plans

Enterprise Plan

Pricing: $15,000/month

Features:

- Unlimited Queries: Banks can handle an unlimited number of customer queries, ensuring no interruption in service regardless of volume.
- Custom Integration: Tailored solutions that integrate seamlessly with the bank's existing systems, providing a cohesive user experience.
- Advanced Analytics and Reporting: In-depth analytics and user usage reports help banks understand customer behavior and improve services.
- Dedicated Account Manager and 24/7 Support: Continuous support and a dedicated account manager to ensure smooth operation and prompt resolution of any issues.

  Motive: The Enterprise Plan is designed for large financial institutions that demand high capacity, bespoke integration, and around-the-clock support to manage extensive customer interactions efficiently.

Premium Plan

Pricing: $7,000/month

Features:

- Up to 500,000 Queries per Month: Sufficient capacity to handle a large volume of customer inquiries.
- Basic API Integration: Standard integration with the bank's systems to facilitate data exchange and operational efficiency.

- Standard Analytics and Reporting: Essential analytics and reports to track and manage user interactions.
- Regular Business Hour Support: Support available during standard business hours to assist with any issues or queries.

  Motive: The Premium Plan caters to medium-sized banks that require substantial query capacity and integration capabilities, along with reliable business hour support and essential analytics to enhance operational efficiency.

Standard Plan

Pricing: $2,000/month

Features:

- Up to 100,000 Queries per Month: Ideal for smaller banks or lower query volumes.
- Core API Integration: Basic integration capabilities to connect with the bank's essential systems.
- Email Support within 48 Hours: Reliable email support to address queries and issues within 48 hours.

  Motive: The Standard Plan is targeted at smaller financial institutions or those with moderate customer interaction volumes, providing essential features and support at a cost-effective price.

Value Proposition

The revenue model is structured to provide maximum flexibility and value to financial institutions of different sizes and requirements. By offering tiered pricing plans, we ensure that banks can choose a plan that best suits their needs, ensuring cost-effectiveness and scalability. The focus on advanced analytics, custom integration, and dedicated support further enhances the value provided, making our AI-driven chatbot an essential tool for modern banking customer service.

Roadmap

Our vision

To revolutionize customer service in the banking industry by providing an intelligent, voice-enabled chatbot that enhances user experience and operational efficiency.

Roadmap

- Phase 1: Prototype Development: Develop a basic prototype with core functionalities.
- Phase 2: Beta Testing: Conduct beta testing with a select group of users to gather feedback and refine the system.
- Phase 3: Full Deployment: Launch the fully developed chatbot and voice assistant to all Chase Bank customers.
- Phase 4: Continuous Improvement: Regularly update the system with new features and improvements based on user feedback and technological advancements.

We are currently at Phase 1, and we expect to move towards Phase 2 in June 2024.

Future Enhancements

- Multi-Language Support: Expand the chatbot's capabilities to support multiple languages.
- Advanced Analytics: Implement advanced analytics to provide deeper insights into user interactions and system performance.
- Third-Party Integrations: Integrate with additional third-party services to expand the range of functionalities offered by the chatbot.

Team and Advisors

Introduction of project team members and their relevant expertise, including technical personnel, veterinary experts, blockchain developers, etc.

Team:

Chi (Bruce) Cheng: Junior, Math-CS major. Backend Developer.

Guidong (Grey) Luo: Junior, Math-CS major.

Xueyan (Aaron) Shi: Junior, CS major. Backend Developer.

Yijun (Jack) Luo: Junior, Data Science Major. Backend Developer.

David Sun: Junior, Data Science major.

Advisors: