Transforming Realty:

AI-Driven Chatbot for Enhanced Complaint Management

Overview

Our solution is an intelligent chatbot for realty that streamlines complaint management. The solution utilizes advanced Natural Language Processing (NLP) techniques for complaint reception, severity evaluation, and automated ticket generation. The system extracts key details from complaints, employs a structured questioning system for root cause identification, and integrates seamlessly with the ticketing system for swift issue resolution. Incorporating a troubleshooting document corpus further enhanced problem-solving capabilities. Continuous learning mechanisms and modular architecture alongside human handover capability ensure scalability, user satisfaction, and streamlined processes. The project yielded improved operational efficiency, cost savings, data-driven insights, and enhanced responsiveness resulting in improved resident satisfaction.

Client Profile

Leading luxury property developer in the United States. Their portfolio comprises residential, commercial, and leisure properties across North America.

Business Requirements

The client required an intelligent chatbot that is capable of receiving, understanding, and processing complaints from residents. The proposed chatbot would autonomously generate its logic and decision trees by analyzing root cause flow diagrams associated with common complaints.

- Complaint reception via text input

- Severity evaluation to prioritize urgent issues

- Automated ticket generation with detailed information for resolution

- Utilization of document corpus for issue resolution guidance

Technical Highlights

- Django and PostgreSQL deployed into EC2 instances with autoscaling enabled for multi-zone deployment

- Incorporated Datadog and New Relic to ensure performance and uptime

- REST APIs for tablet application, internal admin site, driver dashboard, advertiser dashboard, and analytics engine

- Implemented ETLs to export data to the snowflake warehouse for analytics

- Tensorflow integration for rider detection

- Asynchronous jobs for cache mechanism and ETL

- Third-party advertising integrations supporting multiple SSPs

- Game scorecard integration using Stats Perform API

QBurst Solution

A comprehensive chatbot solution leveraging NLP that incorporates components to handle resident inputs, assess complaints, and automate issue resolution.

NLP-based information extraction

Utilized NLP models to extract relevant information from resident inputs. Techniques such as Named Entity Recognition (NER) and sentiment analysis were employed to identify key entities, sentiments, and context from the complaints.

Structured questioning system

Implemented a structured questioning system to systematically identify the root cause and assess the severity of each complaint. A rule-based system is designed to ask targeted questions based on the type of complaint to gather specific details.

Auto generation of bot logic

Developed a unique capability to auto-generate bot logic using root cause flow diagrams. Leveraging the client's organizational knowledge, the system employs these diagrams to automatically configure the bot's decision-making processes, ensuring a tailored and precise approach to issue resolution.

## Utilization of troubleshooting document corpus

Incorporated a comprehensive document corpus detailing troubleshooting procedures. We trained the chatbot using this corpus to aid in problem identification and resolution. Natural Language Understanding (NLU) models were fine-tuned using this corpus to improve the chatbot's ability to comprehend and address various issues.

Integration with ticketing system

Integrated the chatbot with a ticketing system to automate generation of tickets for issue resolution. Upon gathering necessary details, the chatbot creates tickets in the system and assigns them to relevant support personnel or departments based on the nature and severity of the issue.
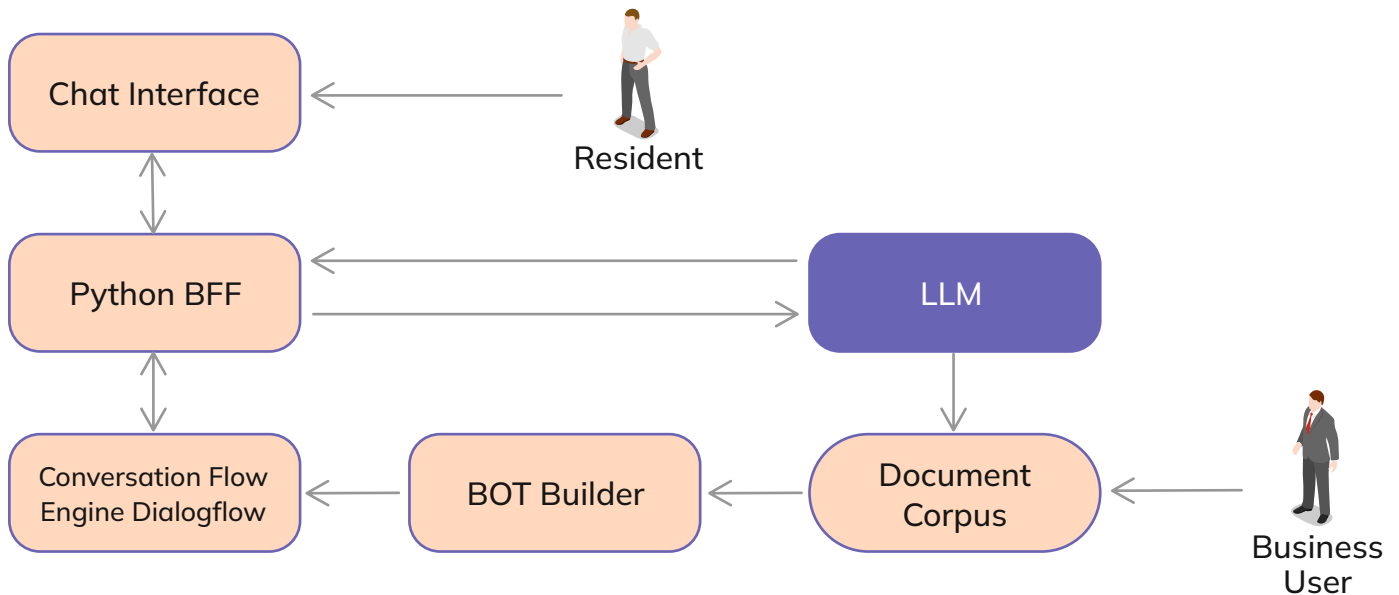
Continuous learning and improvement

Implemented mechanisms for continuous learning and improvement. This involves collecting feedback from ticket resolutions to enhance the chatbot's accuracy and effectiveness over time. We employed techniques such as reinforcement learning to keep the system updated with new information and evolving issues.
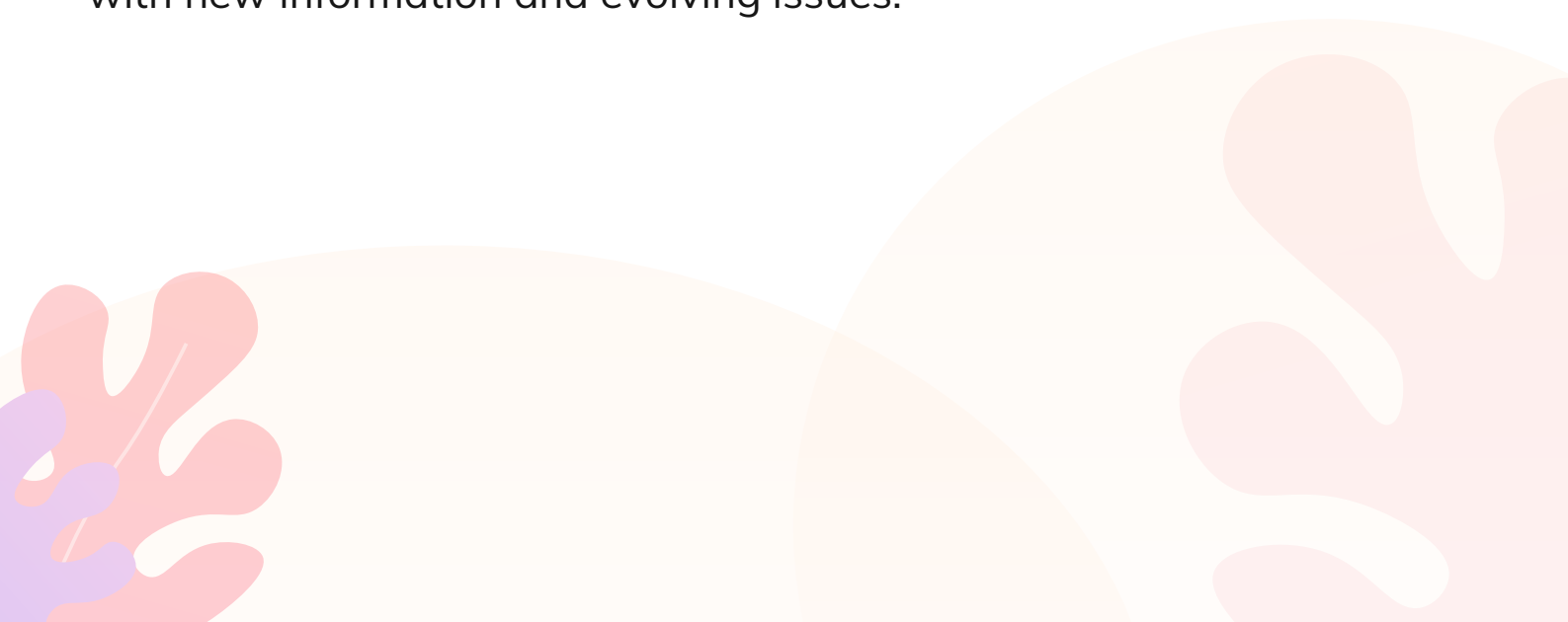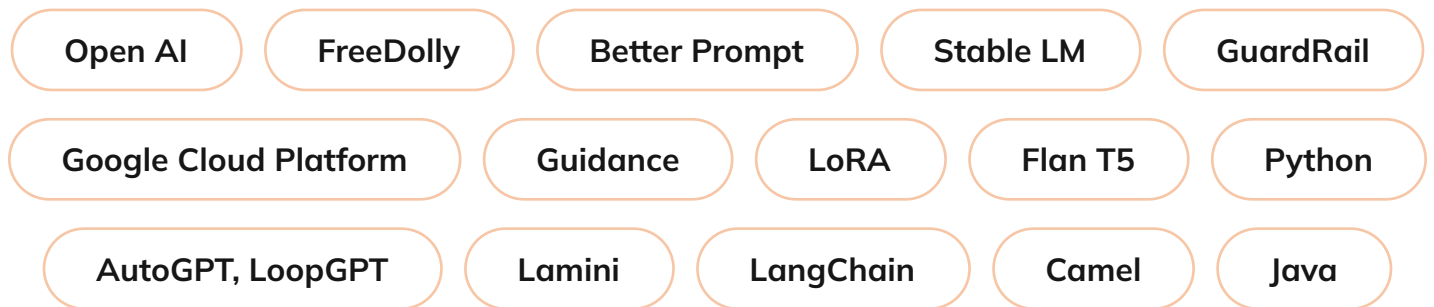
Project Highlights

- **Modular Architecture:** Framework supports seamless integration of Pluggable Language Model Modules (LLMs) including Flan T5, LLAMA2, and cloud-based options like OpenAI for tailored project requirements.

- **PII Data Filtering:** Specifically designed for Cloud-based LLM bots, ensuring secure handling of Personally Identifiable Information for user interactions.

- **Human Handover Capability:** Smooth transition from bot interactions to human assistance when needed for an enhanced user experience.

- **Admin user interface features:**
  - Centralized system to manage knowledge source
  - Initiate training sessions and test bot accuracy using samples
  - Configure multiple bots chaining for comprehensive knowledge access and diverse use case management

- **Performance monitoring and analytics:**
  - Tracks response time, issue resolution accuracy, user satisfaction, and resolved tickets
  - Analyzes data to enhance and optimize the chatbot's performance

- **Scalability and Adaptability:**
  - Designed to handle increased usage and changing resident needs
  - Made to integrate new functionalities and support of different types of issues

Chat Interface

Resident

Python BFF

LLM

Conversation Flow Engine Dialogflow

BOT Builder

Document Corpus

Business User

Technologies Used

Open AI	FreeDolly	Better Prompt	Stable LM	GuardRail
Google Cloud Platform	Guidance	LoRA	Flan T5	Python
AutoGPT, LoopGPT	Lamini	LangChain	Camel	Java

Benefits

○ **Efficient complaint handling:** Automating complaint reception and ticket generation reduced processing time, enhancing operational efficiency.

○ **Improved satisfaction:** Prompt issue resolution boosted resident satisfaction, showcasing responsiveness and commitment.

○ **Cost savings:** Reduced manual intervention led to cost efficiencies in resource allocation.

○ **Data-driven insights:** Generated valuable data for informed decision-making and process improvements.

○ **Scalability and consistency:** Scalable solution ensured consistent handling of complaints, irrespective of volume.

- **Standardized processes:** Structured approach standardized complaint evaluation, ensuring fairness and consistency.

- **Enhanced responsiveness:** Swift discernment of complaint severity led to more responsive resolutions, building trust.