

Enhancement of User Experience on E-Commerce Assistance by Using Chatbot Based on Rasa

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Abstract—Whenever a customer using an E-Commerce sites like Amazon, Flipkart etc, the customer may face some challenges in navigating product options, making purchases, or seeking assistance. It takes time for the customer support to resolve the customer issues since billions of people are using those platforms and reporting the issues regularly. So this makes some congestion on the customer support side, so that they could not react so quickly. One more issue is buying the products by searching from different platforms. This may also takes too much time. In this project adding a chatbot to the platform which can understand the human language and give the response based questions and helps in product filtration. This chatbots will be useful for filtering the products from whatever the e commerce sites it has been incorporated it with (here the own site developed, which runs in local server as other e-commerce api procurement is taking much time than expected) and also replying to some of the issues before they got to the customer call center. So these chatbots have emerged as a promising solution to address these issues.

Index Terms—E-Commerce, Customer Support, Chatbot Integration, Human Language Understanding, Product Filtration, Natural Language Processing (NLP), Customer Experience Enhancement

I. INTRODUCTION

1.1 ABOUT CONVERSATIONAL AI
Conversational AI is a set of technologies that work together to automate human-like communications-via both speech and text-between a person and machines. It combines Artificial Intelligence, Natural Language Processing, Machine Learning to understand, interpret and respond to user inputs in a way that simulates human conversation. Aiming to connect humans and computers, it comprises a bunch of cutting-edge technologies to construct synthetic brainpower that further makes machines or chatbots capable of understanding, reading, & responding to the human language. And we call it conversational AI in technical

terms. You can find the essence of conversational AI in IVR systems, messaging platforms, voice-based communication channels, Chabot, mobile apps, & many other channels. When employees usually spend 16% of their time in in-house communication & collaboration, conversational AI can reduce the time spent on such activities with automated & immediate referrals to customers' issues, according to Bloomfire.

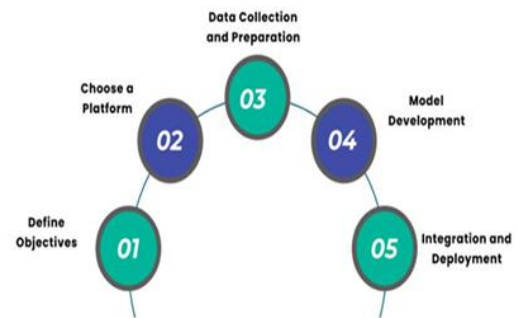


Fig : 1.1 Steps in Conversational AI

1.2 HOW CONVERSATIONAL AI WORKS
Conversational AI works by using a combining Natural Language Processing (NLP), foundation models, and Machine Learning (ML). Conversational AI systems are trained on large amounts of data, such as text and speech. This data is used to teach the system how to understand and process human language. The system then uses this knowledge to interact with humans in a natural way.

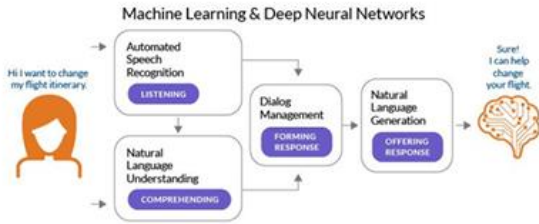


Fig : 1.2 Conversational AI – A Part of ML



Fig : 1.3.2 Chatbots

Step 1: The first step is Input Generation, where a user shares inputs either through conversational voice or text.

Step 2: In the next step, Input Analysis is done to read the input. If the input is text based then natural language understanding (NLU) is used to retrieve the meaning of the words provided. And If the input is speech-based then ASR automatic speech recognition is applied to transit the sound into language tokens for further analysis.

Step 3: Now the third step to understanding the mechanism of how Conversational AI works is Dialogue Management, where a natural language generation process is used to create a direct response to a query raised.

Step 4: At last, this step revolves around Reinforcement Learning, where all user inputs are analyzed to accurate replies from time to time & ensure that their responses are correct & shared with the clients.

CHATBOTS: A Chatbot is a computer program that simulates human conversation with an end user. Not all Chatbots are equipped with Artificial Intelligence (AI), but modern chatbots increasingly use conversational AI techniques such as natural language processing (NLP) to understand user questions and automate responses to them. Chatbots are text-based AI tools that engage users via messaging or websites. They can be rule-based, AI/NLP-driven, or hybrid. Chatbots automate customer support, sales, and lead generation tasks while offering personalized assistance.

VOICE ASSISTANTS: Voice assistants (VA) enable interaction through voice commands. They process spoken language for hands-free engagement & are found in smart phones & speakers.

II. LITERATURE SURVEY

2.1 INTRODUCTION In this chapter will review some papers to get knowledge and understanding on the techniques had been proposed. All those techniques have the same aim which is track the vehicle and estimate the velocity of the moving vehicle. As Archimedes once said, “Man has always learned from the past. After all, you can't learn history in reverse!” it is essential for man to learn from history. Thus, considering all past researches, the most relevant research glimpses have been picked to be explained in detail. The overview shall discuss relevant aspects contributing to our research.

2.2 Superagent: A customer service chatbot for e-commerce websites

ALei Cui, Shachan Huang, Furu Wei, Chuanqi Tan, Ming Zhou

Conventional customer service chatbots are usually based on human dialogue, yet significant issues in terms of data scale and privacy. In this paper, a customer service chatbot that leverages large-scale and publicly available ecommerce data.

III. SYSTEM ANALYSIS

3.1 EXISTING SYSTEM The existing technique for e-commerce chatbot is the Contextual Dialog Management. Creating a chatbot for e-commerce with contextual dialogue management involves designing a system that can understand and respond to user queries in a conversational manner while keeping track of the context of the conversation. It requires natural language processing (NLP) techniques such as intent recognition, entity extraction, and dialogue state tracking. Additionally, you'll need a robust backend

system to handle product catalog queries, order processing, and other e-commerce functionalities.

3.1.1 DISADVANTAGES OF EXISTING SYSTEM

- Implementing contextual dialog management requires sophisticated algorithms and infrastructure, which can increase the complexity of development and maintenance.
- It doesn't have product filtration.
- Sometimes it may struggle to fully understand user queries.
- Large amount of training data is required.

3.2 PROPOSED SYSTEM: In this project we proposed RASA framework to communicate with the user while using the e-commerce assistance. The System consists of the following steps. The core of the system is RASA Open Source, which provides natural language understanding (NLU) and dialog management capabilities. RASA processes user messages, extracts intents and entities, and generates appropriate responses based on predefined rules and machine learning models. Training data is collected and annotated to train the NLU and dialogue management models. The NLU model is responsible for understanding user messages and extracting intents.

3.3.SYSTEM REQUIREMENTS

3.3.1.HARDWARE REQUIREMENTS(minimum):

- System : Pentium IV 2.4 GHz
- Hard Disk : 40 GB
- Ram : 512 Mb.

SOFTWARE REQUIREMENTS:

- Operating System: Windows
- Coding Language: Python 3.7

IV. METHODOLOGY

4.1 SYSTEM ARCHITECTURE

The System consists of the following steps :-

1. Chat Interface
2. RASA NLU
3. RASA CORE
4. Bot Response

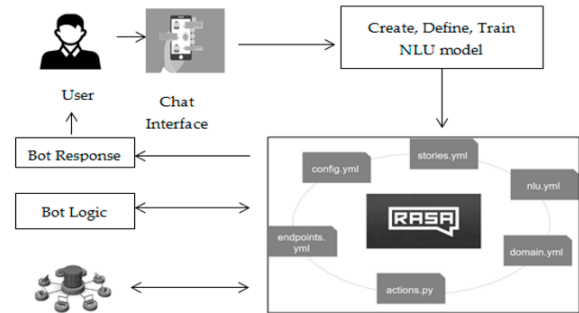


Fig 4.1: System Architecture

4.2 CHAT INTERFACE A Chat Interface is the user-facing component of a chatbot or conversational AI system where user interact with the bot through text-based messages. It serves as the medium through which users can ask questions, make requests, provide information, or engage in conversation with the bot. The chat interface typically includes a text input field where users can type their messages or queries. Users can enter natural language text to communicate with the bot and initiate conversations.

4.3 RASA NLU RASA NLU(Natural Language Understanding) is a component of the framework that focuses on understanding and interpreting user messages in conversational AI applications. It is responsible for extracting structured data, such as intents and entities, from unstructured user inputs, enabling the chatbot to understand user requests and respond appropriately. It consists of Intent Classification and Entity Recognition.

V. SYSTEM DESIGN

5.1 INTRODUCTION The most creative and challenging phase of the life cycle is system and design. The term design describes a final system and the process by which it is developed. It refers to the technical specifications that will be applied in implementation the candidate system. The design may be defined as “the process of applying various techniques and principles for the purpose of defining a device, a process or a system in sufficient details to permit its physical realization”.

5.2 UML Diagram

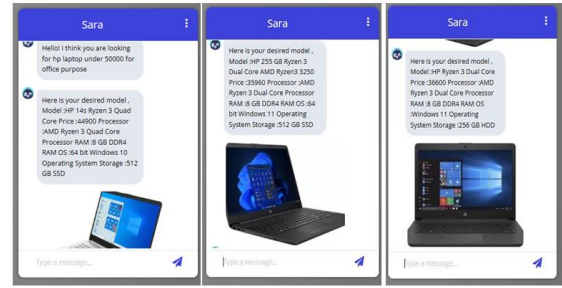
- UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

• The goal is for UML to become a common language for creating models of object-oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

VI. SYSTEM IMPLEMENTATION

6.1 Evaluation Criteria In this study, we construct a chatbot for real-time product filtration and we use it to display the details of required product of user that are available in various e-commerce platforms such as flipkart, amazon, etc., In this process, we: a) Use chatbot for user interface. b) RASA framework to effectively provide product details. c) Use DIET classifier algorithm to process the conversation.

6.2 Output Screenshots The execution of the process will be explained clearly with the help of the continuous screenshots. The whole process in the execution is giving input to the chatbot and it will automatically process the input and provide the respective output of product based on user requirements. This whole process is done in four simple steps. Each figure mentioned below are the simultaneous process of outputs.



VII. TESTING AND VALIDATION

7. TESTING & VALIDATION Software Testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding, Testing presents an interesting anomaly for the software engineer. The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

7.1 Testing Objectives include:

1. Testing is a process of executing a program with the intent of finding an error
2. A good test case is one that has a probability of finding an as yet undiscovered error
3. A successful test is one that uncovers an undiscovered error.

CONCLUSION

In this project we design a chatbot that will help to the customers who are using e-commerce platforms. First, we have created a chatbot that will take user queries as input. The chatbot process the input through NLU and understand user intents. Based on these intents the dialogue management produce the output. The chatbot will asks the requirements of user about the product and display the product details that are present in various e commerce platforms. This will help the customers to easily search the products in a short period of time. The adoption of a Rasa-based chatbot for e-commerce assistance presents a significant

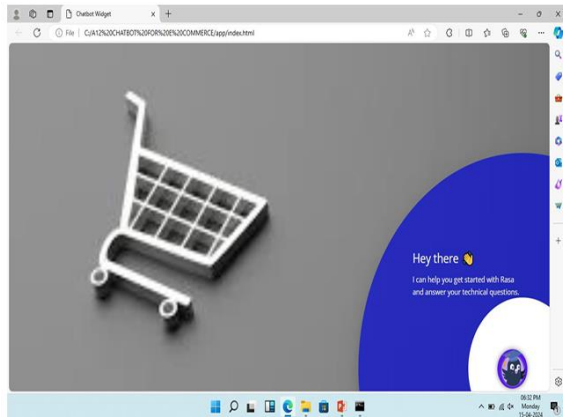


Fig : 1 – The Webpage of the project

The user enters the input in user interface. Next the input is trained by Natural Language Understanding (NLU) and the NLU understand the user intents and create the output response based on input. The output is generated by Dialogue Management.

opportunity for businesses to elevate their online shopping experience.

FUTURE ENHANCEMENTS

After many efforts we had successfully implemented the product filtering. Here are some future enhancements :

- Multimodal Interaction: Enable voice input/output for users who prefer to interact with the chatbot through speech.
- Natural Language Understanding (NLU) Improvement: Train the chatbot with more data to better understand user intents including the synonyms of given text..

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