Internship Project Report

On

Intelligent Customer Help Desk with Smart Document Understanding

Under Supervision Of

Smart Bridge

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Introduction

1. Overview

The goal of this project is to build an intelligent chatbot for businesses to scale faster without using excess human resources and for consumers to get interactive answers without having to read a user manual using a chatbot.

The bot created in this project is based on the OnePlus user manual of their latest smart-phone OnePlus 8 Pro.

IBM Cloud is the Platform that holds all these modules and creates a gateway to building end products. Basically this is an AI-enabled chatbot that recognizes the user queries and answers the question based on a certain input. This AI bot understands the query using NLP (Natural Language Processing) and NLU (Natural Language Understanding).

2. Purpose

The most important purpose of this project is to reduce the automation tasks, we can do this by building an intelligent and scalable, real-time learning chatbot using IBM Watson that can help the customer efficiently to find anything without the help of a human and applying smart document understanding to even make the user manual interactive for the customer.

Literature Survey

1. Existing Problem

The main problem that any business has to go through is scalability. The problem of providing better customer service is something that can be ignored or taken lightly but due to limited human resources, the need to handle customer help desk and to solve problems in a consumer-friendly and cost-effective way is of utmost importance.

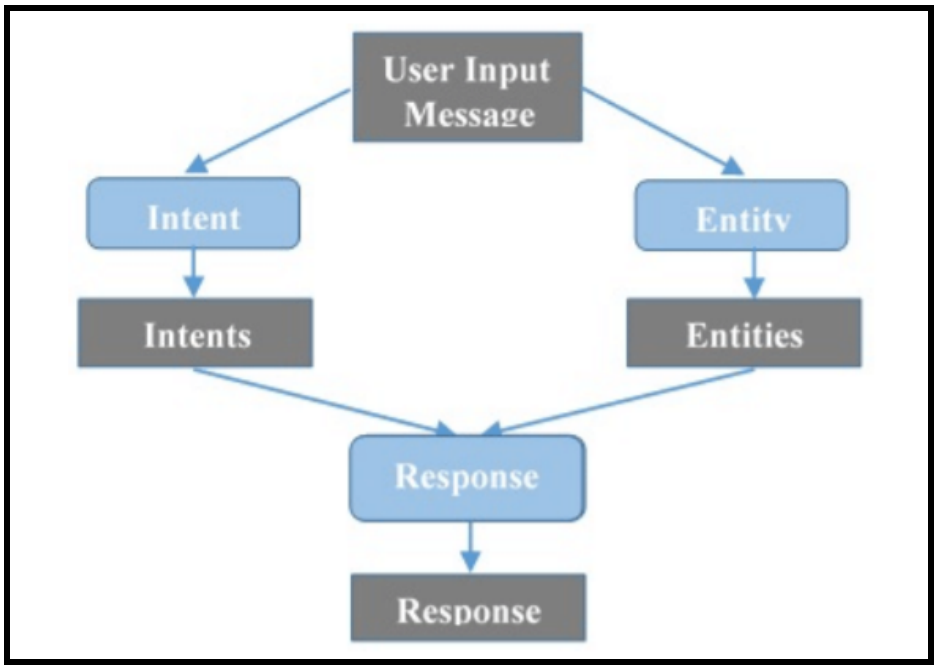
The other problem is the documentation for the product tends to be long and complicated due to certain business requirements and rules. This can lead to a loss in service to customer value.

2. Proposed System

The proposed solution consists of building a highly intelligent chatbot to handle all the customer requirements and provide functions like reminders and transactions with ease. The second problem can be tackled by using Smart Document Understanding by using the IBM Watson Discovery Services. These services can be combined together to make a highly intelligent chatbot service to be embedded into the company website. So, if any question falls out of the trained intents/question within seconds bot will make a request to the Watson discovery and pull the answer from the document which we have trained earlier.

Theoretical Analysis

1. Block Diagram



2. Software Designing

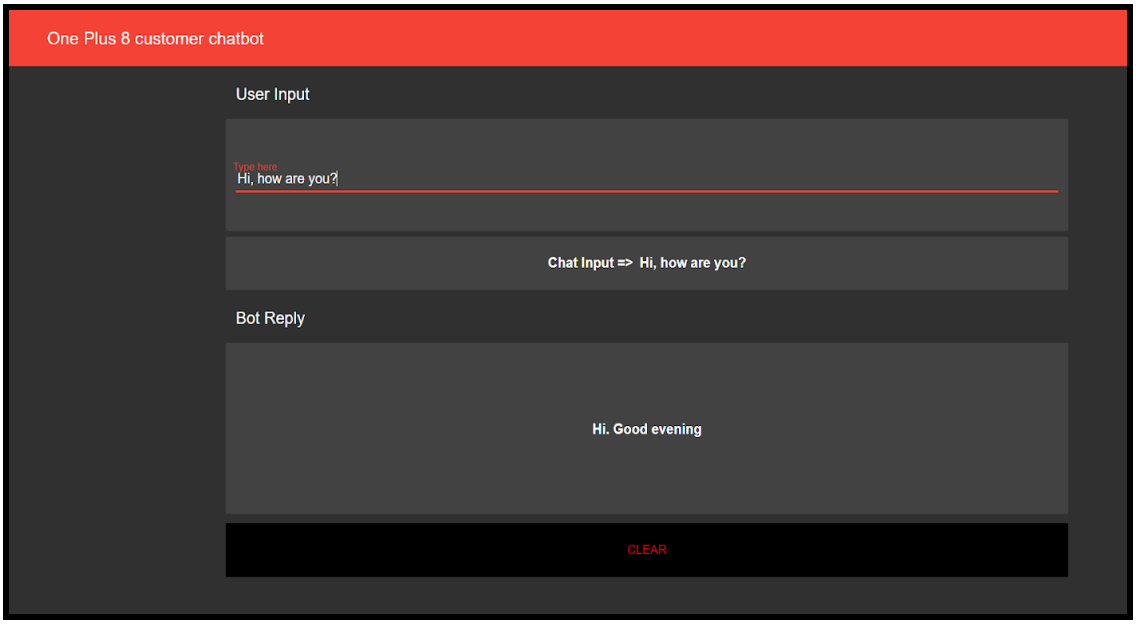
The Project was kicked off using an Agile process known as Kanban. Each Task had to go through (not done, In progress, Review, Completed) columns. Using this software engineering technique, we were able to complete the project in a quick, efficient, and complete way. The steps performed were as follows:

a. Create necessary Watson Services.
b. Configure Watson Discovery.
c. Create Watson Cloud Functions Action.
d. Configure Watson Assistant.
e. Integrate Watson Discovery with Watson Assistant using webhook.
f. Build Node-RED flow to integrate Watson Assistant.
g. Deploy using a web dashboard.

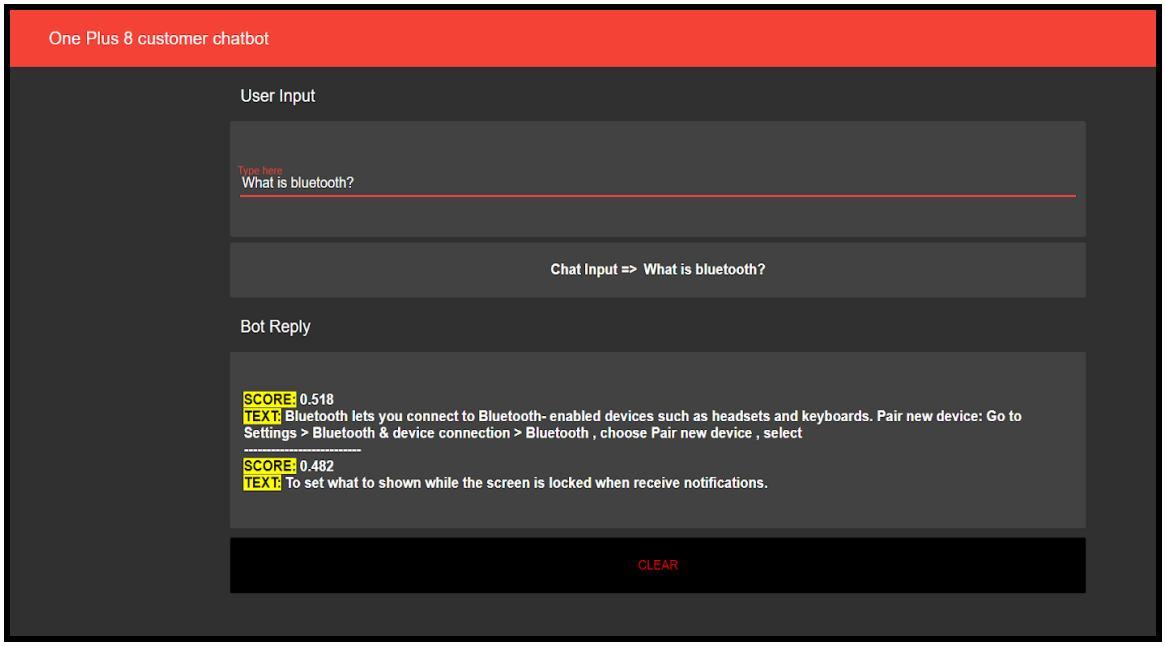
Experimental Investigations

After creating use-case specific intents, entities, improving query results of the Watson discovery on our document, and training the Watson skill here are some of the experiment runs:

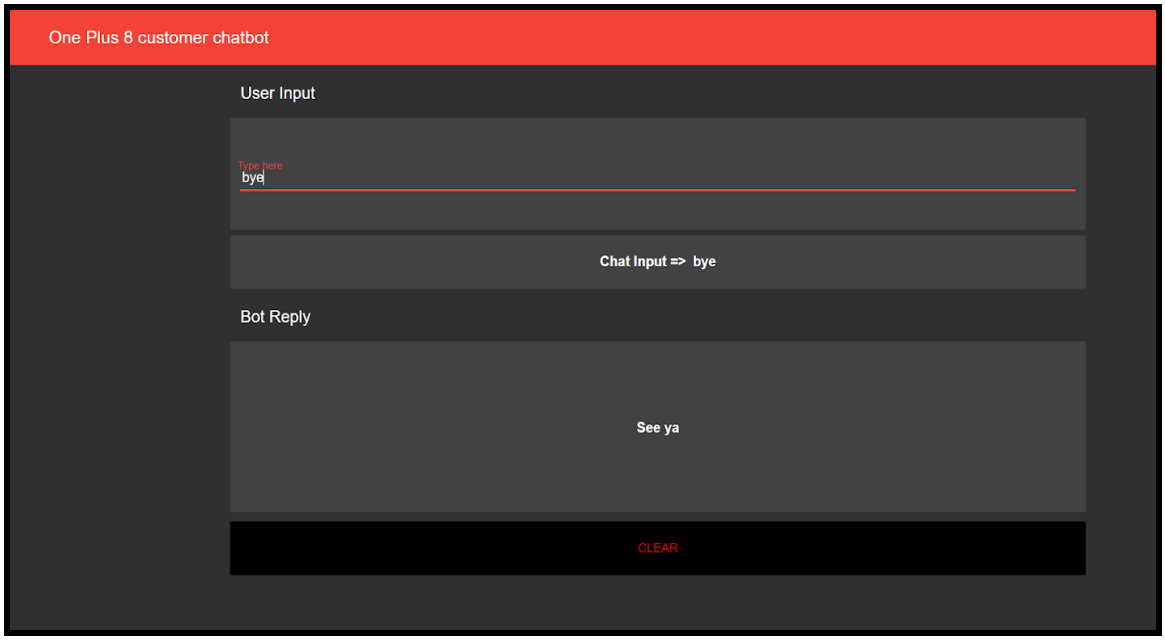
1. Basic



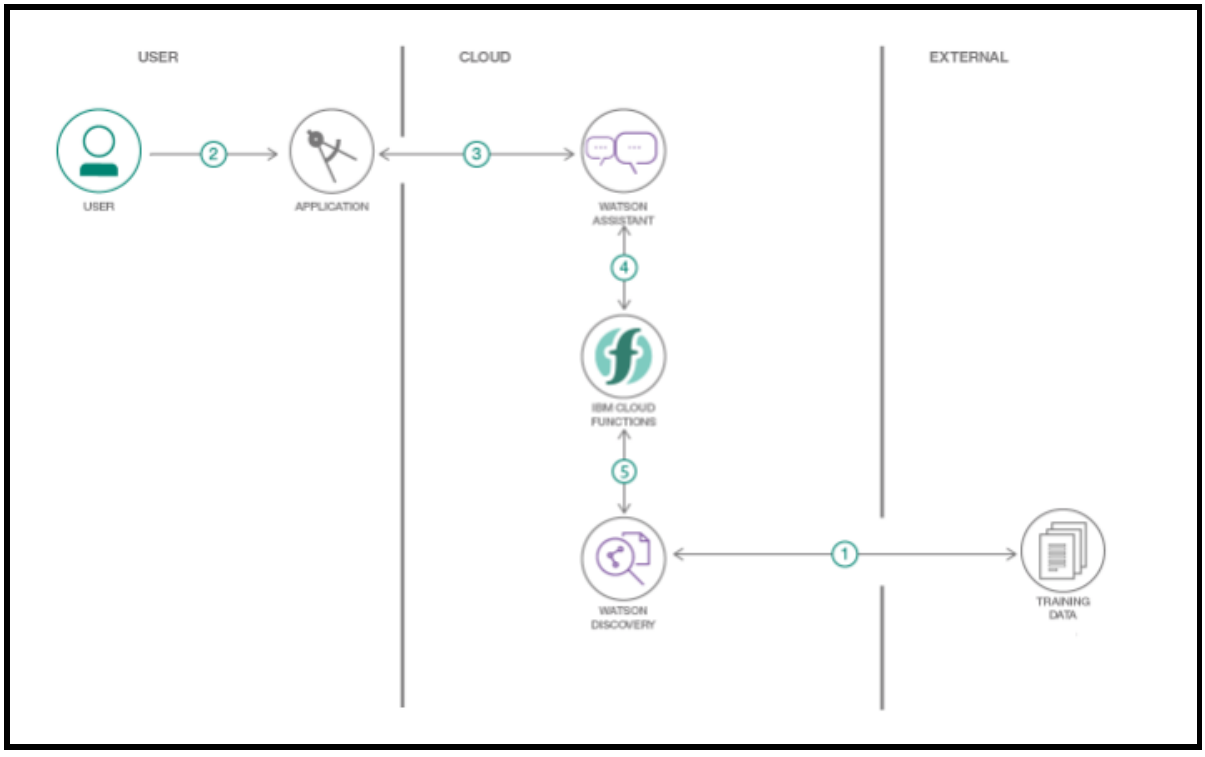
2. Customer query



3. Conversation end



Flowchart



Result

We have created an AI-enabled chatbot that gives interactive answers from documentation made possible with Smart Document Understanding provided by IBM Watson Discovery Services.

Advantages and Disadvantages

1. Advantages

- It automates repetitive tasks.
- It is less expensive in the long run.
- It is available 24/7.
- It never stops learning and updating itself for better performance
- Increases user interaction.
- It can be integrated into any platform.
- Rich analytics and customer interaction
- Instantaneous response without the need for human response delays
- This chatbot can Management of multiple clients

2. Disadvantages

- It will take more time for training if we have a big dataset.
- It has a Complex internal working.
- They may not be able to solve complex queries
- It has a high building and maintenance costs.

Applications

User applications on this type of bots can be used for specialized tasks like cab hiring, food ordering or even checking the weather via human-like interaction.

Similarly, Businesses can save their cost & time with customer support using AI Chatbots and even manage their inventory and purchase orders efficiently. Operations can be scaled pretty fast for startups without hiring too much manpower for the customer support team. With this, human resources can be diverted more to the core operations and work more efficiently. Chatbots can be used to deliver reminders, messages to the customers at the perfect time, and in this way, we provide more value to the consumer.

Some real-world use cases of chatbots are:

- Medical: This chatbot can be used as a virtual doctor which can track the symptoms of the user and alerts them when it is an emergency. This can also give suggestions based on their suggestions.

- Booking Appointments: Chatbots are smart so, they can also book appointments like Hospitals, meetings, saloons, restaurants, boot camps, etc..,

Conclusion

Hence, we were able to create an intelligent chatbot with a smart document understanding that can fetch answers to the user from a user manual and create an extremely efficient & intelligent chatbot.

Future Scope

1. Voice-based control

The next-generation chatbots are already in the building process. Chatbots like Amazon Alexa, Google Assistant, etc. already are changing the way we interact with electronics surrounding us and are slowly getting integrated into our lives.

2. Emotion recognition Chatbots

Chatbots are becoming smarter, though understanding human emotions through language and giving an appropriate response is a hard problem. There has been some great research done for tackling this problem. NLP is making tremendous things by improving them.

3. Smart Control

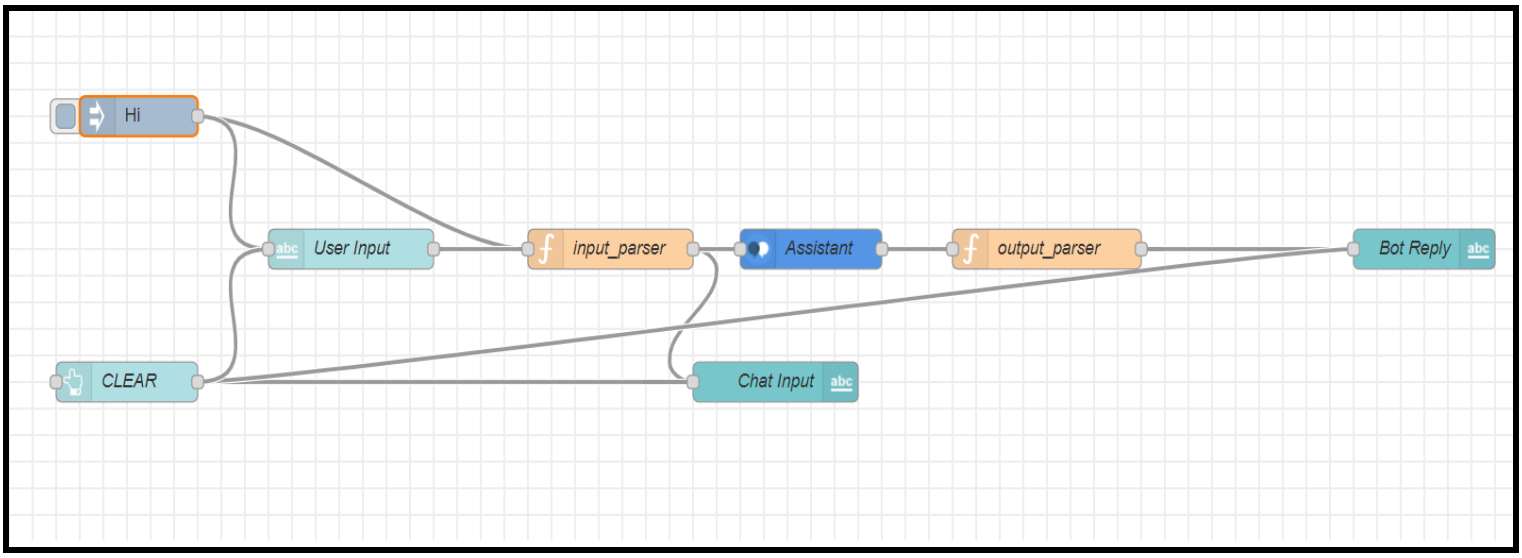
Smart control in the sense we can control all our surroundings by virtual bots. Like we can unlock the door by saying “open the door.” Integrating the IoT and Chatbots will have a great impact.

Bibliography

1. How to Build a Chatbot with Watson Assistant
2. Getting started with Discovery
3. Build Your Own AI Assistant (Chatbot) with IBM Watson Assistant
4. Integrate Watson Assistant With Just About Anything
5. Build Your Own AI Assistant (Chatbot) with IBM Watson Assistant
6. Getting Started with Node-RED Dashboard

Source Code

Node-red Flow



Node-red Source Code

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\"\";\n// text_ += \"<center>BOT
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{\n\n    if
(msg.payload.intents[0].intent
== \"product\") {\n        let
score_1 =
msg.payload.context.webhook_resu
lt_1.passages[0].passage_score;\
n        let text_1 =
msg.payload.context.webhook_resu
lt_1.passages[0].passage_text;\n
\n        let score_2 =
msg.payload.context.webhook_resu
lt_1.passages[1].passage_score;\
n        let text_2 =
msg.payload.context.webhook_resu
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\n        \n        let
sum_scores = score_1 +
score_2;\n        \n
text_ += `<mark>SCORE:</mark>
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)}<br/>`;\n        text_ +=
`<mark>TEXT:</mark>
${text_1}`;\n    \n        text_
+=
\"<br/>-------------------------
-<br/>\";\n    \n        text_
+= `<mark>SCORE:</mark>
${(score_2/sum_scores).toFixed(3
)}<br/>`;\n        text_ +=
`<mark>TEXT:</mark>
${text_2}`;\n    \n        \n
} \n    else {\n        text_ +=
msg.payload.output.text[0];\n
}\n} catch (err) {\n    \n
text_ = \"Sorry, please try
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