PROJECT REPORT

Internship Title: Intelligent Customer Help Desk with Smart Document Understanding - SB30619

Project Title: Intelligent Customer Help Desk with Smart Document Understanding

Category: Artificial Intelligence Developer

Name: Sameera Tasneem

E-mail: sameeratasneem3@gmail.com

PROJECT ID: SPS_PRO_99

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1.INTRODUCTION

PROJECT OVERVIEW:

A chatbot is often described as one of the most advanced and promising expressions of interaction between humans and machines. However, from a technological point of view, a chatbot only represents the natural evolution of a Question Answering system.Usual chatbots used by most of the companies for their users are not entirely self sufficient.They often face some issues of understanding the customer's exact queries at exact times.This project 'Intelligent customer help desk with smart document understanding' helps in providing and improving the functionality of the chatbot.
The features in IBM Watson is used to implement certain functionalities. SDU-Smart document understanding, one of the main features in Watson Discovery help to determine the important content in the document provided in order to reduce the scope of confusion. If a customer asks a question, the application will redirect it to Watson discovery service, which has already been loaded with device/service manual. The system gets train each and every time so that it gives us correct / exact results everytime a user asks for a question.

1.1 FUNCTIONAL REQUIREMENTS:

The project primarily focuses on using web services, therefore access to these services along with account cloud platforms. Services used will be:

a. IBM Cloud Platform
b. Watson Discovery Collection.

1.2 SOFTWARE REQUIREMENTS:

The software requirements for the chat bot applications are:

a. IBM Watson Services
b.IBM Cloud Platform

c.Node-red flow

1.3 TECHNICAL REQUIREMENTS:

a. Web Dashboard should be accessible with different browsers.(Google Chrome,Firefox,Internet Explorer etc)
b. Application should be scalable.
c. Application should be able to adapt to changes.
d. The application should be able to handle a surge in usage.

1.4 SCOPE OF WORK:

a. Create a customer care dialog skill in WatsonAssistant.
b. Use Smart Document Understanding to build an enhanced Watson Discovery collection.
c. Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to WatsonDiscovery.
d. Build a web application with integration to all these services &deploy the same on IBM CloudPlatform.

2. LITERATURE SURVEY

2.1 Proposed Problem

The typical customer care chatbot can answer simple questions, such as store locations and hours, directions, and maybe even making appointments. When a question falls outside of the scope of the preddetermined question set, the option is typically to tell the customer the question isn't valid or offer to speak to a real person.

2.2 Proposed Solution

Steps

1. Create IBM Cloudservices

2. Configure WatsonDiscovery
3. Create IBM Cloud Functionsaction.
4. Create a Node red flow to connect all the services together.
5. Configure WatsonAssistant.
6. Create flow and configurenode
7. Deploy and run Node Redapp.

1. Create IBM Cloudservices

Create the following services:

1. WatsonDiscovery
2. WatsonAssistant
3. NodeRed

2. Configure WatsonDiscovery

Import the document
Launch the Watson Discovery tool and create a new data collection by selecting the Upload your own data option. Give the data collection a unique name. When prompted, select and upload the holograms.pdf file located in the data directory of your local repo.

3. Configure WatsonAssistant

Launch the Watson Assistant tool and create a new dialog skill. Select the Use sample skill option as your starting point. This dialog skill contains all of the nodes needed to have a typical call center conversation with a user.
Add new intent:

The default customer care dialog does not have a way to deal with any questions involving outside resources, so we will need to add

this.Create a new intent that can detect when the user is asking about operating the Product. From the Customer Care Sample Skill panel, select the Intents tab.Click the Create intent button. Name the intent #Field_Information, and at a minimum, enter the following example questions to be associated with it.

Create new dialog node:

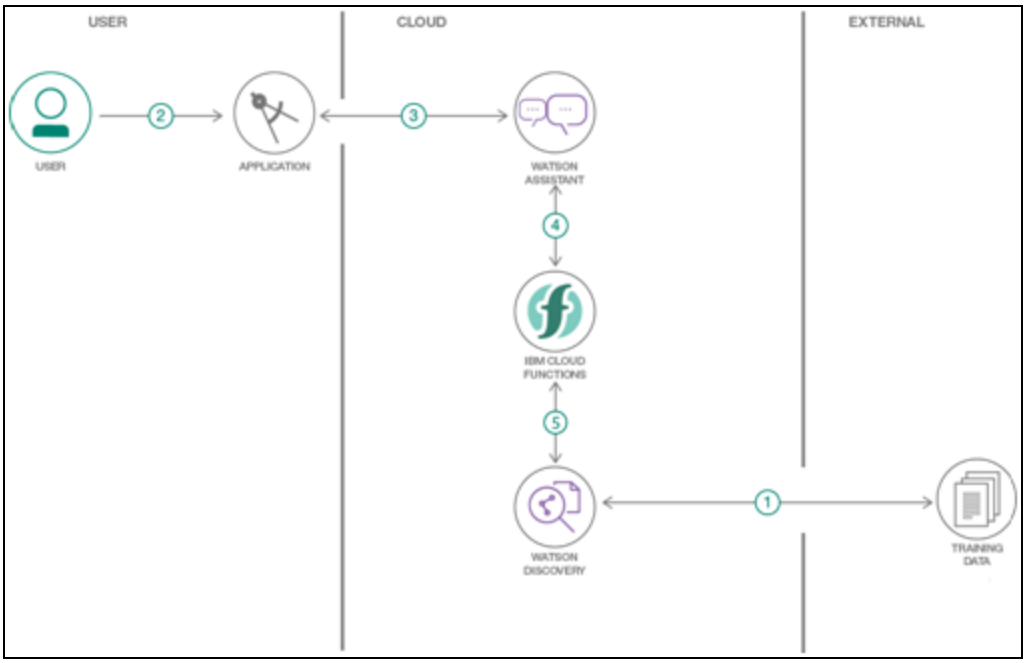
Now we need to add a node to handle our intent. Click on the Dialog tab, then click on the drop-down menu for the Small Talk node, and select the Add node below option. Name the node "Ask about holographic field" and assign it our new intent. This means that if Watson Assistant recognizes a user input such as "what are the pre-requisites?", it will direct the conversation to this node.

Enable webhook from Assistant:

Set up access to our Webhook for the IBM Cloud Functions action you created in Enter the public URL endpoint for your action. Return to the Dialog tab, and click on the Ask about holographic node. From the details panel for the node, click on Customize, and enable Webhooks for this node: Click Apply. The dialog node should have a Return variable set automatically to $webhook_result_1.This is the variable name you can use to access the result from the Discovery service query.

3.THEORETICAL ANALYSIS

3.1 Block Diagram



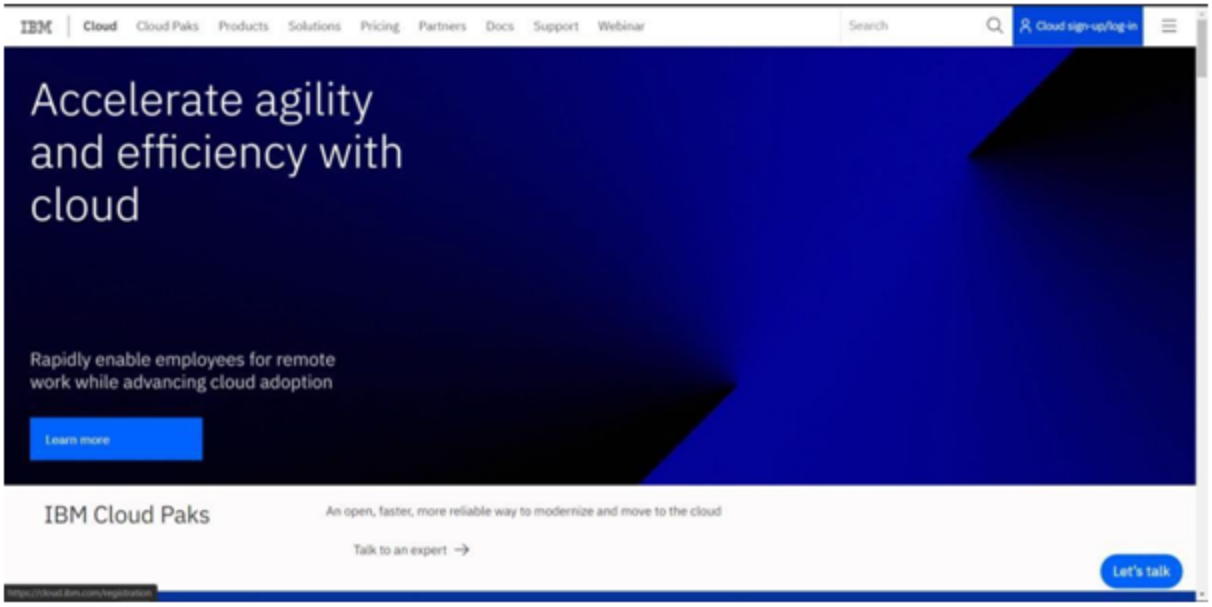
3.2 Hardware/Software Designing

1. Create IBM Cloud Services
2. Configure Watson Discovery
3. Create IBM Cloud Functions action
4. Configure Watson Assistant
5. Build Node-RED Flow to Integrate All Services
6. Configure the nodes and Build A Web Dashboard in Node-RED
7. Deploy and Run the application

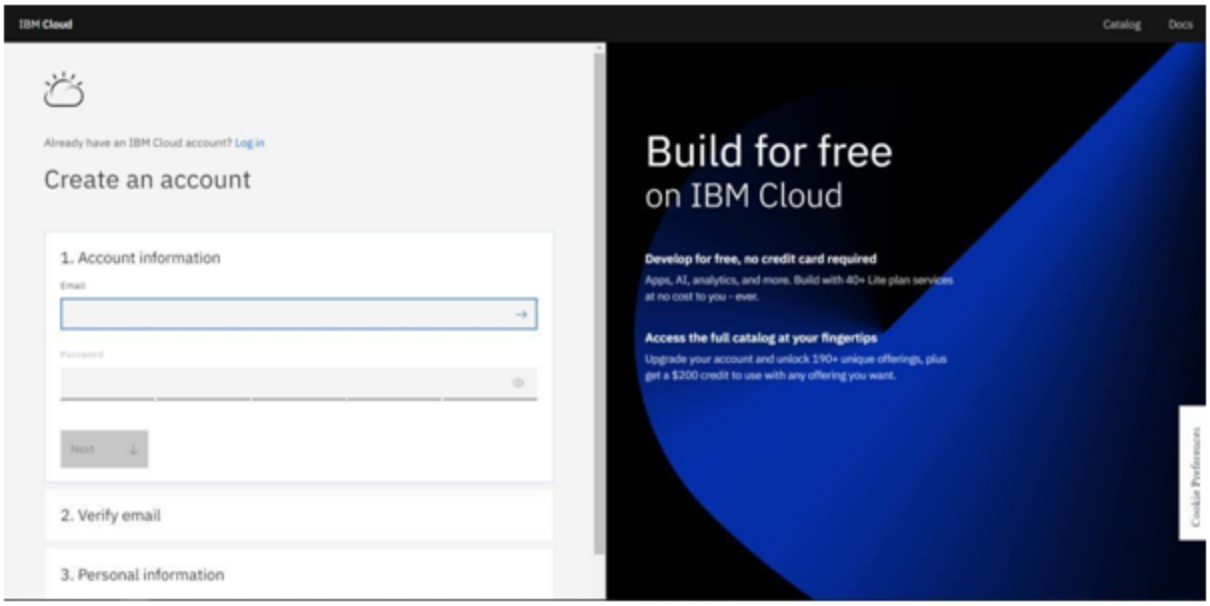
4.EXPERIMENTAL ANALYSIS

1.Create IBM Cloud services:

To Create IBM Cloud, go to https://www.ibm.com/cloud

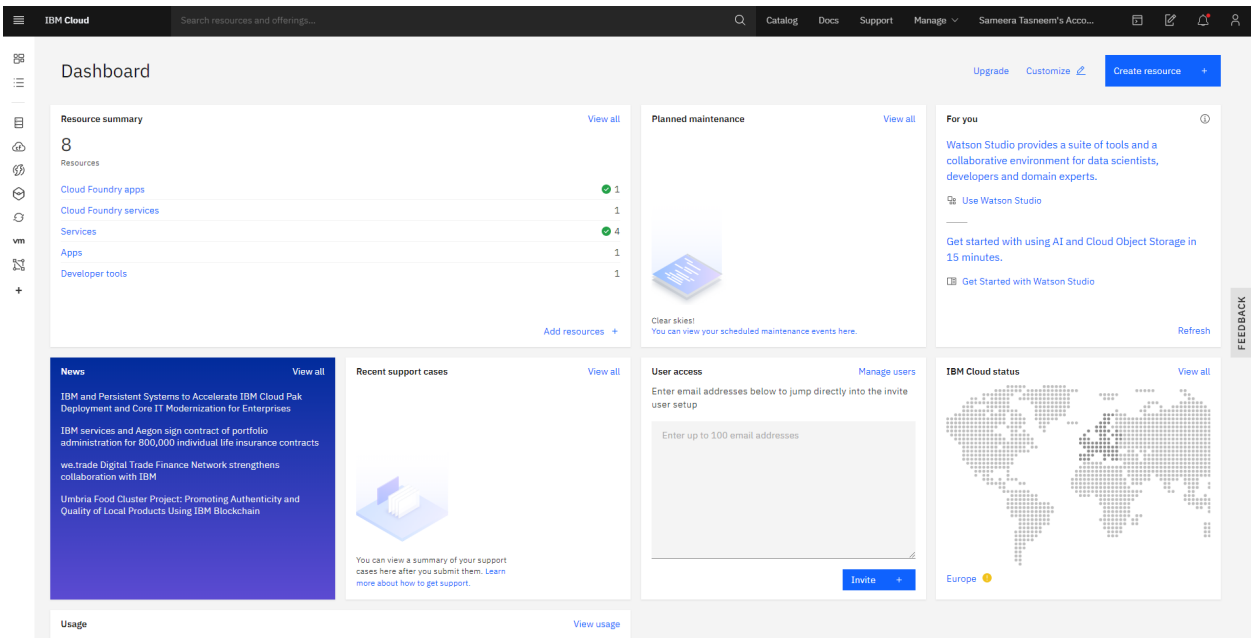


Click on  to sign-up or login to IBM Cloud

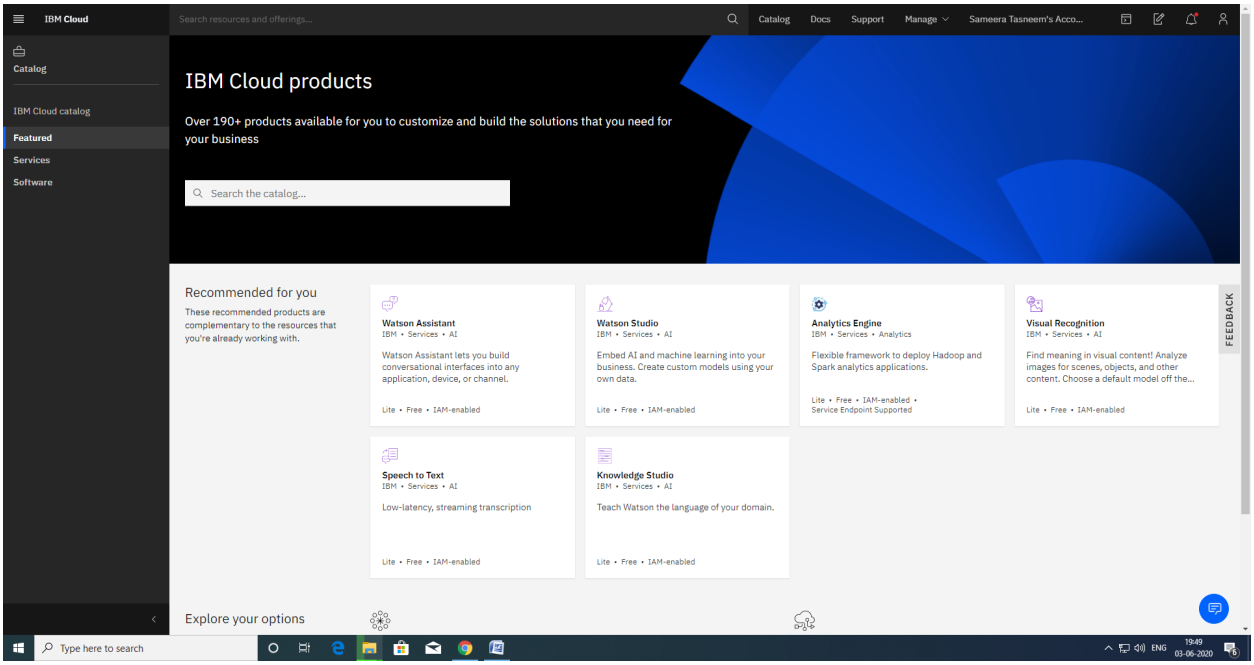


For Cloud Log In, click on and Log in to your cloud account

After Logging in, you can see the IBM Cloud Dashboard.



To Create any Resource (Services/Apps/etc), click on 

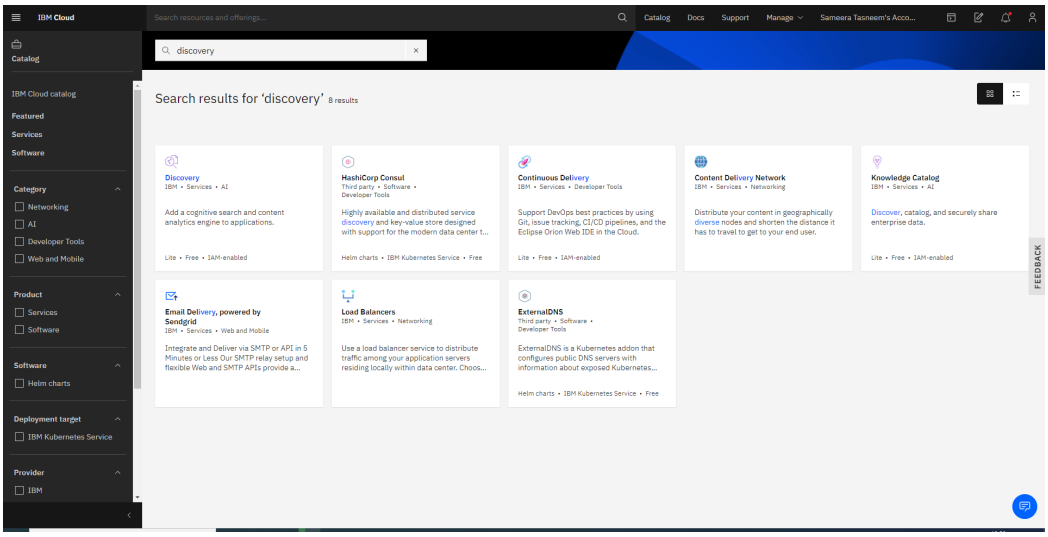


Using the search box, we can find the service we want.

For this project, we need to Create the following services:

1. Watson Discovery
2. Watson Assistant

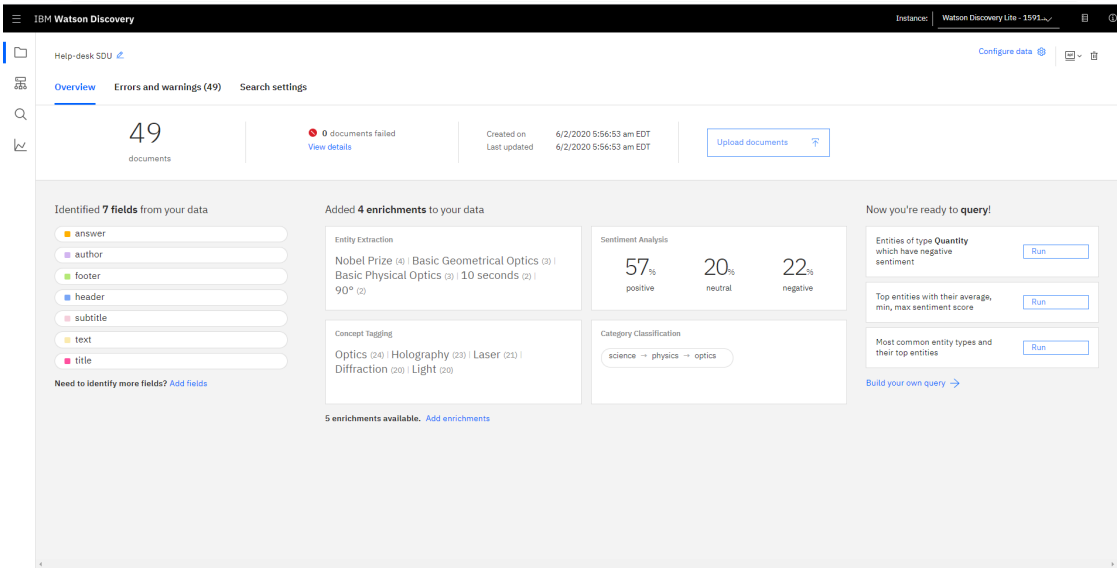
1.To create a Watson Discovery Service, search for Discovery in the search box



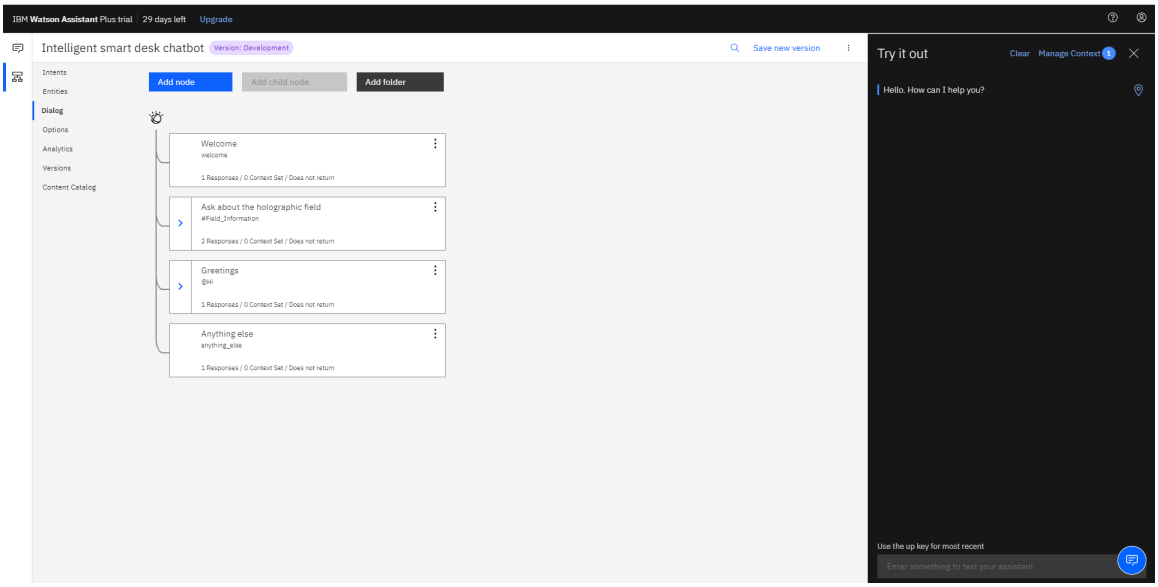
Click on 

2.To create Watson Assistant, go through the procedure same as the above one.

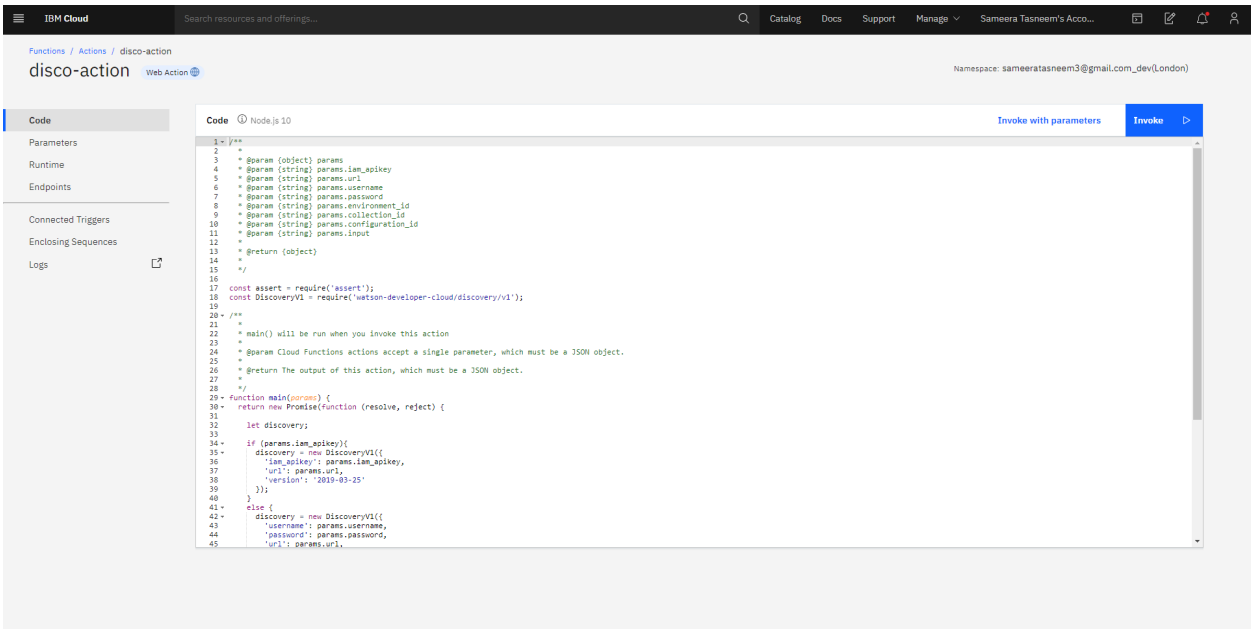
Watson Discovery:



Watson Assistant:



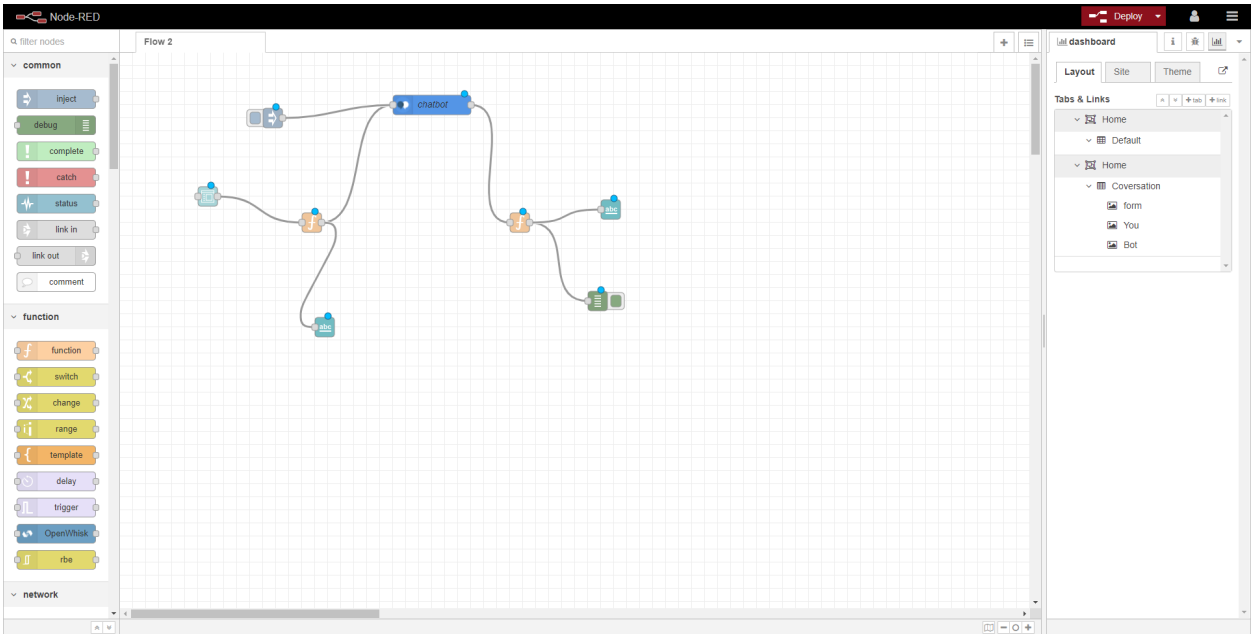
Cloud Functions:



Create Node-red Flow and Configure the Node:

At first go to manage palette and install dashboard. Now, Create the flow with the help of following node:

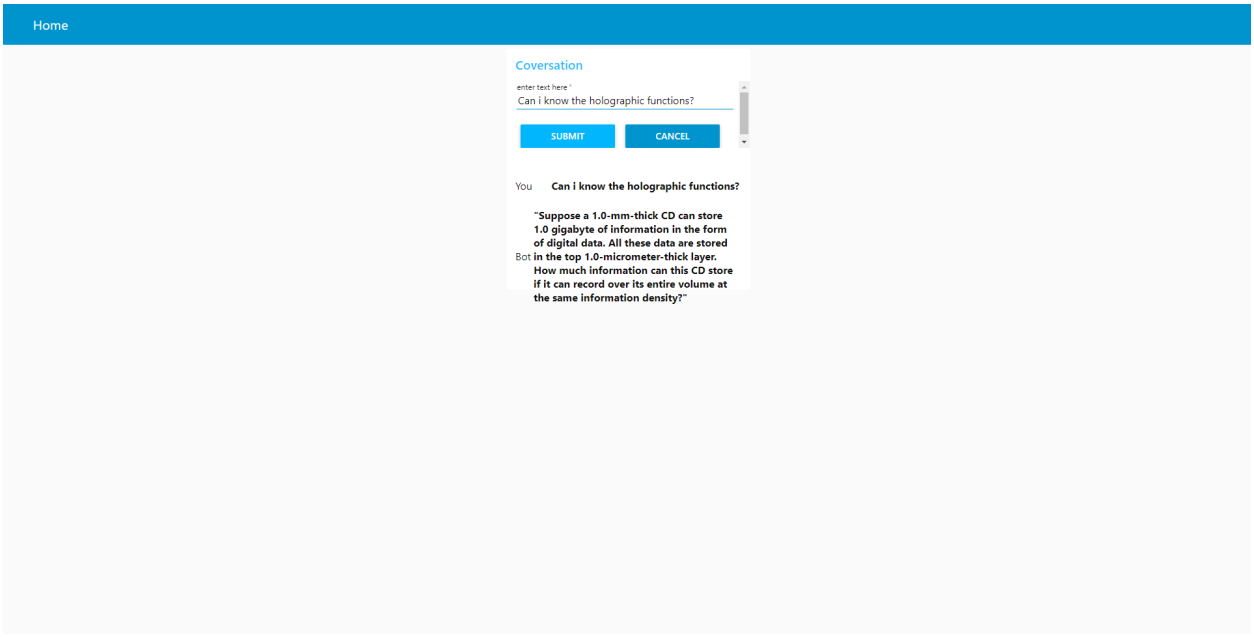
- Inject
- Assissant
- Debug
- Function
- UI-Form
- UI-Text



Deploy and run the node app:

Deploy the Node Red flow by this link:

https://node-red-yxmxu.eu-gb.mybluemix.net/ui



5.ADVANTAGES & DISADVANTAGES

Advantages:

Reduced costs:

Chatbots eliminate the need for labor during online interaction with customers. This is obviously a great advantage for companies that receive multiple queries at once. In addition to saving costs with them, companies can align the chatbot with their objectives, and use them as a means to enhance customer conversion.

24/7 Availability:

Unlike humans, once we install a chatbot, it can handle queries at any time of day. Thus, the customer does not have to wait for a commercial of the company to help him. This also allows companies to monitor customer « traffic » during non-working hours and contact them later.

Learning and updating:

AI-based chatbots are able to learn from interactions and update independently. This is one of the main advantages. When you hire a new employee, you have to train

them continuously. However, chatbots « form » themselves (with certain limitations, of course).

Management of multiple clients:

Humans can serve a limited number of customers at the same time. This restriction does not exist for chatbots, and they can manage all the necessary queries simultaneously. This is one of the main advantages of using chatbot, as no customer is left unattended and youare solving different problems at the same time. There are chatbots companies already working on developing voice chatbot services.

Disadvantages:

Complex interface:

It is often considered that chatbots are complicated and need a lot of time to understand what you want in customer. Sometimes, it can also annoy the client about their slowness, or their difficulty in filtering responses. They don't get you right: Fixed chatbots can get stuck easily. If a query doesn't relate to something you've previously « taught » it, you won't understand it. This can lead to a frustrated customer and the loss of the sale. Other times they do understand you, but they need double (or triple) as many messages as one person, which spoils the user experience.

Bad memory:

The chatbots are not able to memorize a conversation already had, which forces the user to write the same thing over and over again. This can be cumbersome for the client and annoying for the effort required. Therefore, it is important to be careful when designing chatbots and make sure that the program is able to understand users' queries and respond accordingly.

6.APPLICATIONS

Help User:

This chatbot will be useful for the user to ask the assistant the queries related to the Product and will give them clear guidance about the Product. If the Assistant doesn't know about a certain query, it will redirect to the correct person for it.

Content delivery:

Media Publishers have realized that chatbots are a powerful way to engage with theiraudiences and monitor engagement to gain valuable insights on reader interests. Chat with the CNN and Wall Street Journal Chatbots on Facebook Messenger and receive the latest news directly in Messenger, without having to visit their websites.

Companionship:

The primary function of the chatbot is to be a virtual companion – To speak with senior people on general topics like the weather, nature, hobbies, movies, music, news, etc. The chatbot asks questions, reacts to the answers, is able to speak on various topics, and share interesting news and facts from Google.

7.FUTURE SCOPE

Future Scope of this chatbot can be by adding the following to make it more advance:

Smarter Virtual Assistants:

Much of what virtual assistants do now are basic skills, such as retrieving data and basic computation. As natural language processing (NLP) continues to mature, virtual assistants will improve their comprehension and response capabilities, allowing for their use to become more widespread and complex. Also, as machine learning progresses, we may see virtual assistants become smarter and begin to learn and predict customer needs.

Integration with IoT Devices:

Car speakers, smart home devices, and wearables are just a few examples where the virtual assistant is departing from its original hardware and making its way to in-context devices. These integrations ensure that virtual assistants can always be near their human and ready to support any need. It is expected that these integrations will continue at an accelerated pace throughout 2018.

Voice-control:

Voice recognition can be added with the virtual assistant. Then the customer can control application by using his voice. Soon, we could be joining meetings with a voice command, instead of dialing in the long meeting ID and password.

8.CONCLUSION

This chatbot will be useful for the user to ask the assistant the queries related to the Product and will give them clear guidance about the product. If the

Assistant doesn’t know about a certain query, it will redirect to the correct person for it. Chatbots are quickly making transformational changes and allowing businesses to thrive through customer interactions. The feedback and survey through chatbots strengthen the position of businesses as they analyze the reason behind different levels of customer approval. Use of conversational AI chatbots only means better engagement and relentless need for customer satisfaction in the near future.

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