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# Help Desk Chatbot Based on AI using IBM Cloud Application

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**ABSTRACT:** Smart Document Understanding and an Intelligent Customer Helpdesk The assignment file and the Node-Red drift of the chatbot built making use of numerous IBM Watson Services for the backend and Node-Red for the the front end may be discovered in this repository. A common customer support chatbot can answer primary questions like business locations and hours, directions, and from time to time even appointment scheduling. When a query falls out of doors of the scope of the pre- determined query set, the choice is commonly to inform the patron the query isn't legitimate or provide to talk to a real person. IN this mission, there could be every other alternative. If the client question is about the operation of a device, the software shall skip the query onto Watson Discovery Service, which has been pre-loaded with the tool's proprietor's manual. So now, instead of "Would you like to talk to a customer consultant?" we are able to return applicable sections of the proprietor's manual to assist solve our customers' troubles. So, until and till customer in particular asks for a purchaser consultant the bot will attempt to solve all your queries. To take it a step similarly, the mission shall use the Smart Document Understanding characteristic of Watson Discovery to educate it on what text inside the proprietor's manual is crucial and what isn't always. This will improve the solutions lower back from the queries. Then the use of Watson movements as webhook, Watson Discovery can be integrated with Watson assistant. Finally the use of Node-Red, Watson assistant can be integrated with a web UI. This UI can then be used to connect to Watson assistant and chat with it.

**KEYWORDS:** Ecobee3, Watson Discovery, Watson Assistant, Node Red.

## I. INTRODUCTION

### a. Overview:

We may be able to write an utility that leverages more than one Watson AI offerings like Discovery, Assistant, Cloud Function and Node Red.

By the give up of the mission, we can research exceptional practices of mixing Watson Services, and the way they can build interactive retrieval system with discovery + assistant.

- Project Requirements: Python, IBM Cloud, IBM Watson
- Functional Requirements: IBM Cloud
- Technical Requirements: Python, Watson AI, ML
- Software Requirements: Watson Assistant, Watson Discovery

### b. Purpose:

The chatbot normally can answer simply simple questions, together with keep locations and hours, instructions and perhaps even making appointments.

When any consumer enter (query) falls out of the scope of the predetermined query set of chatbot, it generally tells us to rephrase our sentence or mention that this query is not legitimate.

In this assignment we are able to be emphasizing to lessen the workload from the representative by using supervising our chatbot in the sort of manner that it could answer lots of the questions (the product data). We can return the applicable sections from the consumer manual that can assist us to lessen the variety of clients of every consultant at a call Centre.

Generally chatbot are loaded with a sure set of questions this is greater like if and else glide, the question or the user enter which lies out of the scope of the chatbot isn't answered and alternatively a message like "Try again after rephrasing" & "I am not able to recognize, Please Rephrase" are displayed and it directs the person to the customer

agent or the consultant however an efficient chatbot should reduce the site visitors achieving to the representatives, So to achieve this we include a Smart chatbot in order that it is able to solution the queries of the consumer.

We may be shifting the decision to representatives specially instances simplest. To take this a step further, the challenge shall use the Smart Document Understanding furnished by using the Watson Discovery to educate at the textual content, which is a modified model of Natural Language Processing.

**Scope of Work:**

- Create a client care conversation talent in Watson Assistant.
- Use smart report expertise to construct a better Watson Discovery Collection.
- Create an IBM Cloud Function web motion that lets in Watson Assistant to publish queries to Watson Discovery.
- Build a web software with integration of all the services and deploy the same on IBM Cloud Platform.

**II. RELATED WORK**

- Many corporations' chatbots run on messaging apps or actually via SMS. They are used for B2C customer service, income and marketing. In 2016, Facebook Messenger allowed developers to place chatbots on their platform. There had been 30,000 bots created for Messenger within the first six months, growing to one hundred,000 with the aid of September 2017.
- Used via marketers to script sequences of messages, very similar to an Autoresponder series. Such sequences may be brought on by way of consumer decide-in or the usage of keywords within consumer interactions. After a cause happens a sequence of messages is brought till the next expected person reaction. Each person response is used within the choice tree to help the chatbot navigate the reaction sequences to supply the appropriate reaction message.
- In 2016, Russia-based totally Torchia Bank launched the arena's first Facebook bot for quite a number of economic offerings, inclusive of a opportunity of making bills.
- In July 2016, Barclays Africa additionally launched a Facebook chatbot, making it the primary bank to do so in Africa.
- The France's 1/3-biggest financial institution via overall assets [41] Société Générale released their chatbot called So Bot in March 2018. While eighty% of customers of the Robot expressed their delight after having examined it, Société Générale deputy director Bertrand Casserole said that it'll by no means update the know-how furnished by a human advisor.

**III. THEORETICAL ANALYSIS**

**Block/Flow Diagram**

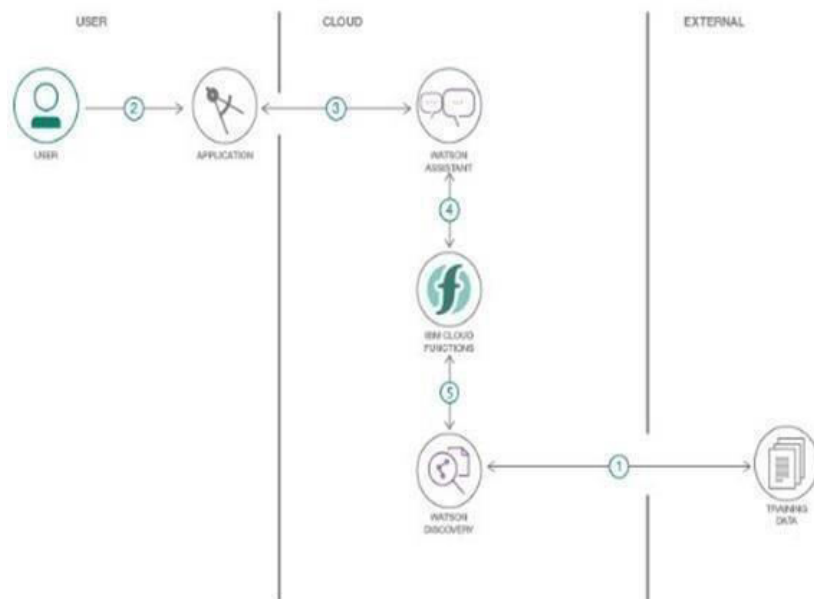


Fig: 01- Block Diagram

### **Hardware/Software Designing**

- Create IBM Cloud services.
- Configure Watson Discovery
- Create IBM Cloud Function action
- Configure Watson Assistant
- Create flow and configure node
- Deploy and run node red Personal Identity number (PIN).
- After verifying the Personal Identity Number (PIN) with database and account balance of the user's credit card is sufficient for the purchase amount
- The fraud checking module will be activated.

## **IV. EXPERIMENTAL INVESTIGATION**

### **A. Create IBM Cloud Services**

- Watson Discovery
- Watson Assistant
- Node Red
- Configure Watson Discovery
- After growing and launching the invention from the Catalog, Import the file on which on which we want to educate the invention provider.
- We have decided on the ecobee3 user guide placed inside the statistics directory of our neighborhood repository.
- The Ecobee3 is a popular residential thermostat that has a WIFI interface and a couple of configuration alternatives. The result of the queries completed without configuring the statistics gift within the document received be that accurate. But the results improve appreciably after making use of SDU.
- This may be accomplished effortlessly through clicking at the configure putting and then labelling every phrase or element gift inside the file as their respective label inclusive of identify, subtitle, text, photograph, and Footer. Some of the labels are not gift inside the lite plan.
- In the lite plan we are provided with confined content of IBM Watson, the labels assist us in segmentation of the file which enables the discovery to apprehend the file better and offer higher effects.

## **V. WORKING OF PROPOSED SYSTEM**

- After developing the discovery from the catalog, we will be redirected to this base page of discovery where the name of the discovery along with its API Key and URL are cited.
- These credentials may be utilized in similarly steps.
- The outcomes provided by using the discovery can be progressed, all the outcomes are proven in assistant in which the invention reveals the sentiment to be positive.
- Matching between the query or query entered by way of the consumer and the statistics of the document. Better the sentiment analysis corrects the effects are.

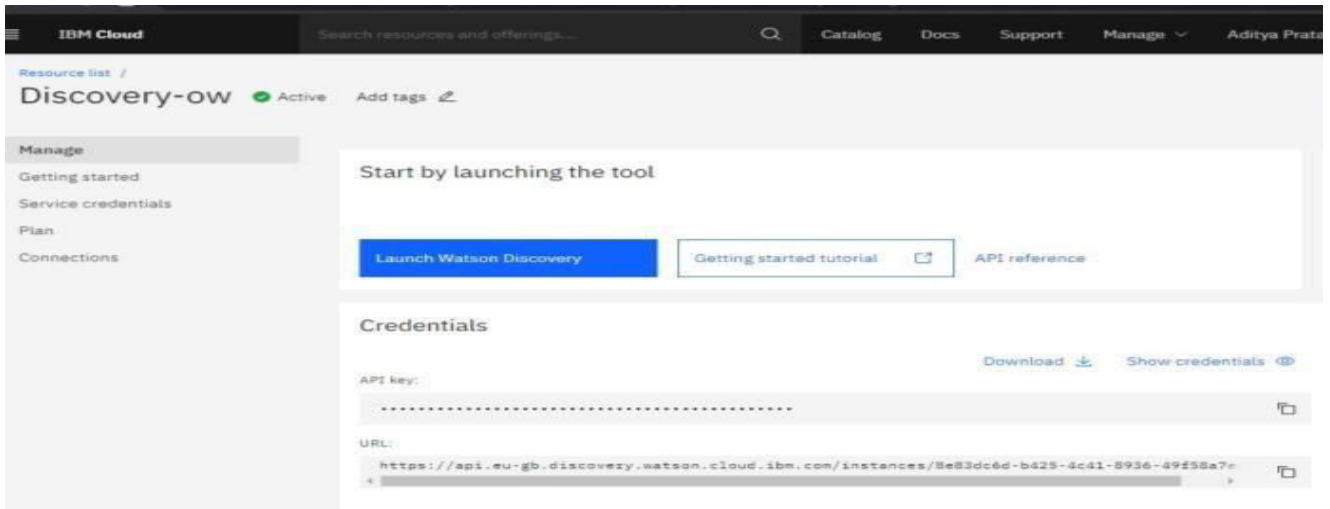


Fig: 02- Watson Discovery Launch Window

- Now within the next step we must add the facts by using clicking, upload your statistics. Here we've already uploaded the information as owners-guide.

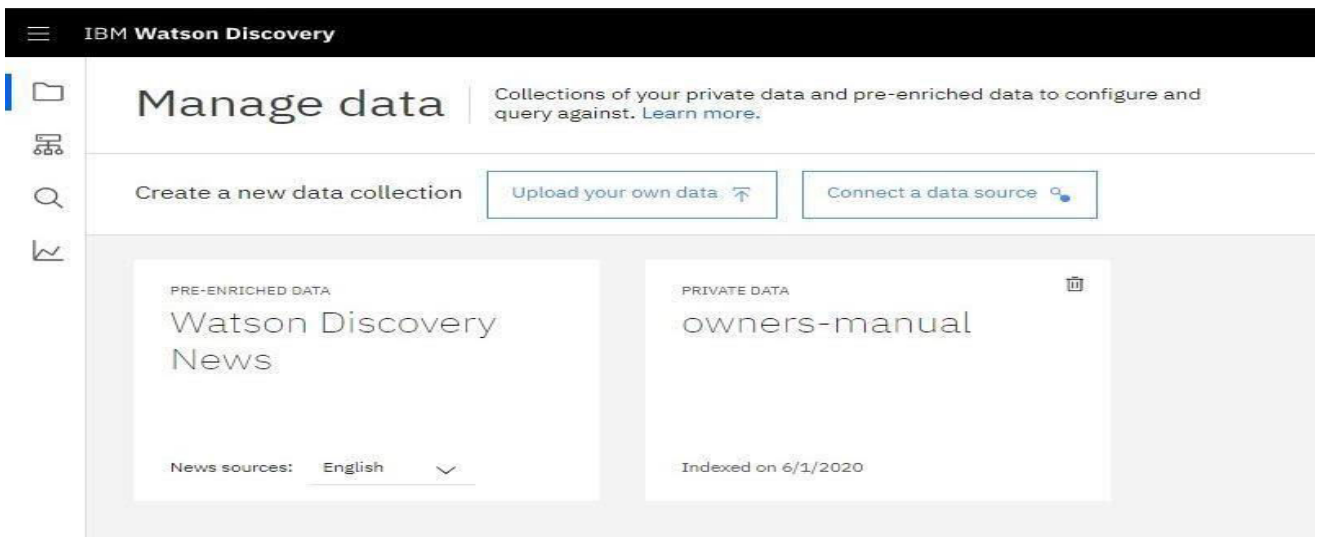


Fig: 03-Watson Discovery (Upload owner-guide)

- After importing the document, we are able to see the page like this, we will ignore the warnings section as it is due to the normalization method and is of no worry. Now click on at the build your personal question, so that we will have an idea how the outcomes have significantly progressed after configuring the information.

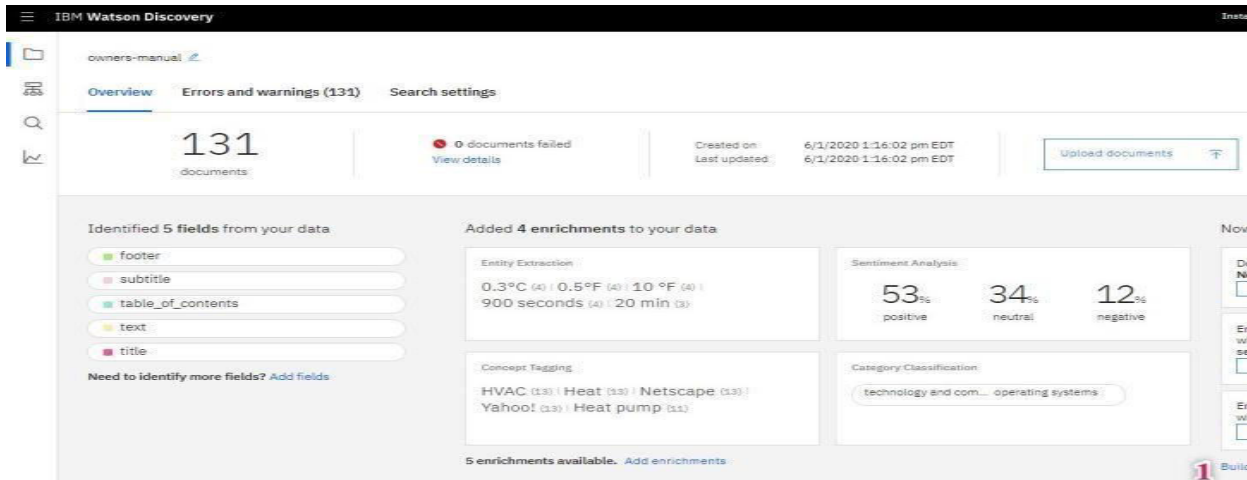


Fig: 03-Watson Discovery (Manual Configuration)

- Enter the queries related to thermostat and consider the results. As you may see, the outcomes aren't very beneficial and now not even that applicable. The subsequent step is to annotate the report with SDU.

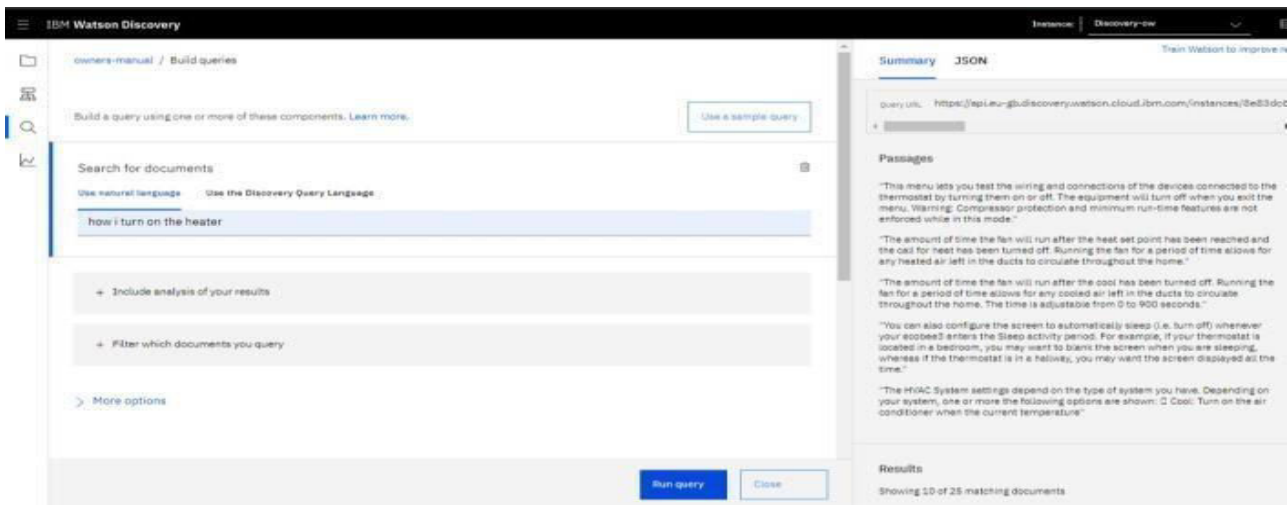


Fig: 04-Waston Discovery (Test window)

- Below is the format of Identify fields tab of the SDU annotation panel.

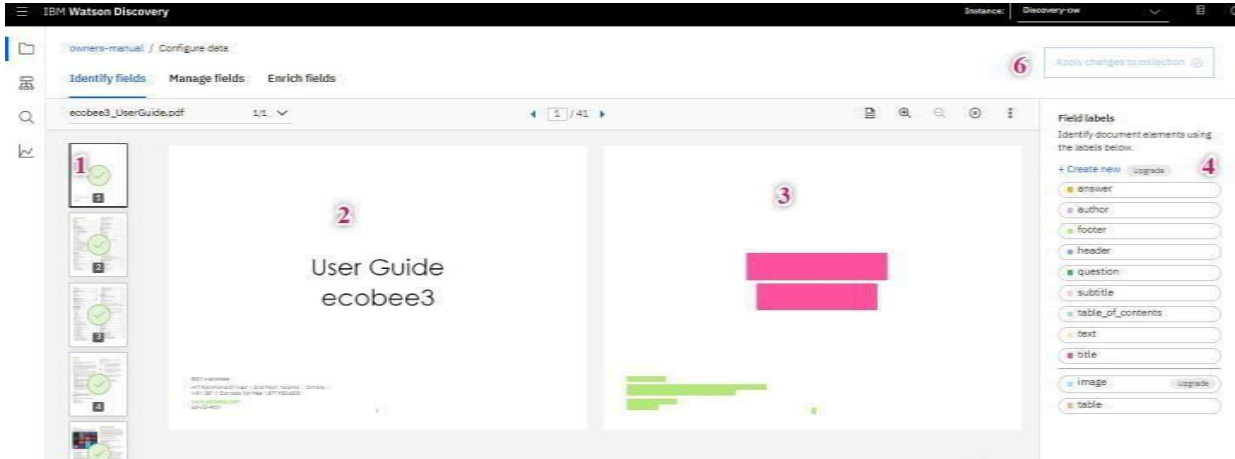


Fig: 05- Waston Discovery (SDU annotation panel)

The intention is to annotate all the pages of the file, in order that discovery can examine what text is vital and what textual content can be unnoticed.

- [1] is the list of pages we have in the document. In the lite plan we are unable to upload a document more than 50,000 words and any document with more than that will be trimmed to this range.
- [2] is the current page being annotated.
- [3] is the page in which we have to provide a label to each text, for example as shown above we have the Title and text, at the bottom we have the footer.
- [4] is the list of labels we can provide in which the image label is not available in the lite plan.
- We have to click the submit page button [5] after annotating each page individually, after few pages the discovery will automatically give the label to the remaining pages.
- Click [6] after completing the annotation of the document.

For in addition segmentation and making the sub files, we ought to control the fields. Here we're furnished with the option of identifying field to index i.e. What all texts are vital for us, as we can see in the under snip, we have become on most effective subtitle and text because they're the best 2 labels in which we are involved. On the right facet we have the option splitting the record as consistent with desire of our label. We have decided on subtitle here. This can vary as consistent with special desires of user.

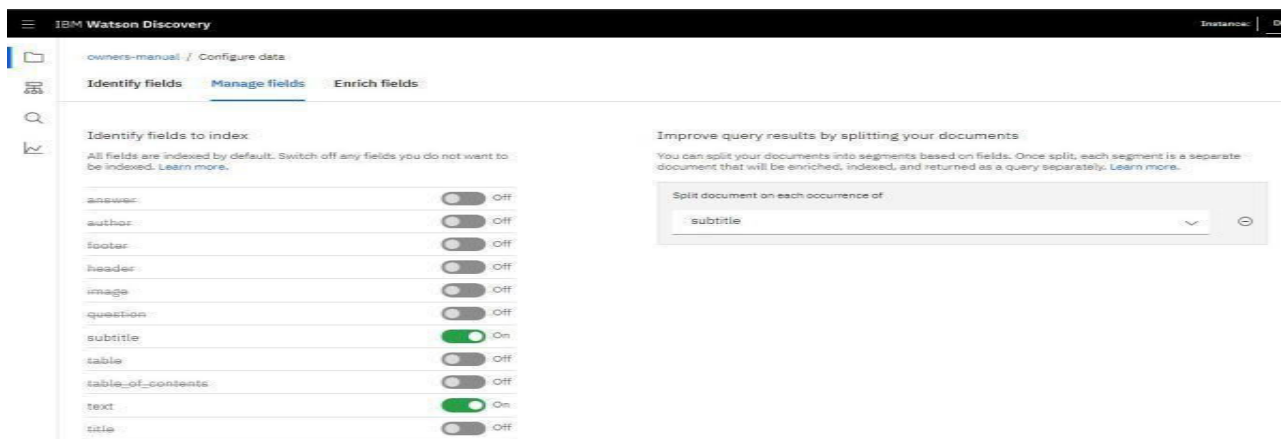


Fig: 06-Watson Discovery (Segmentation)



After doing the whole lot as referred to above, we need to click on Apply changes to Collection.

It will make an effort to process and after that we are able to have a couple of documents as proven under, the document we uploaded in advance is segmented in 131 documents as shown.

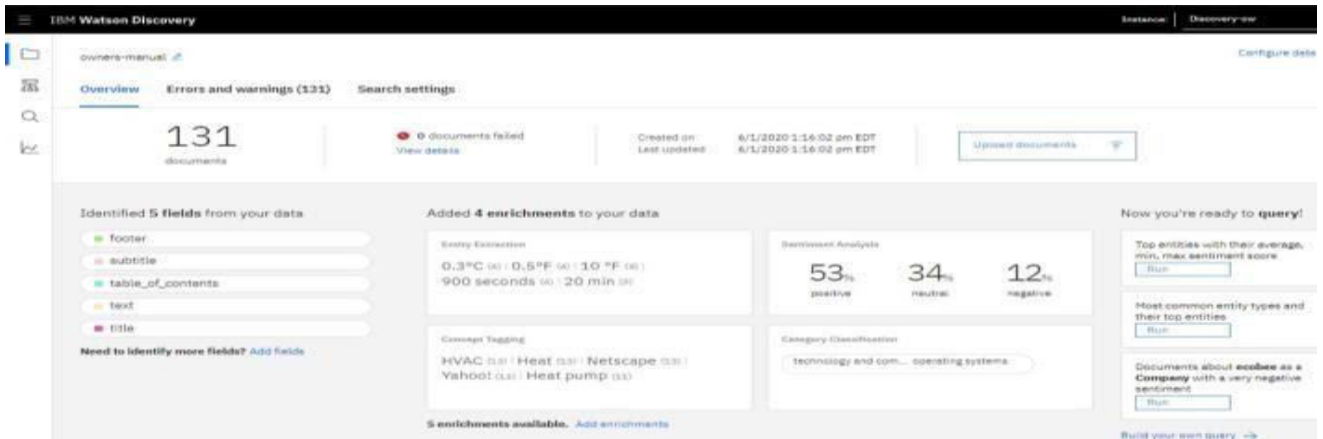


Fig: 07- Watson Discovery (Overview Window)

- Return to the query panel and try to build the same query as earlier and check the result. We will observe an improved result
- Next, we must create the IBM Cloud Function Action:

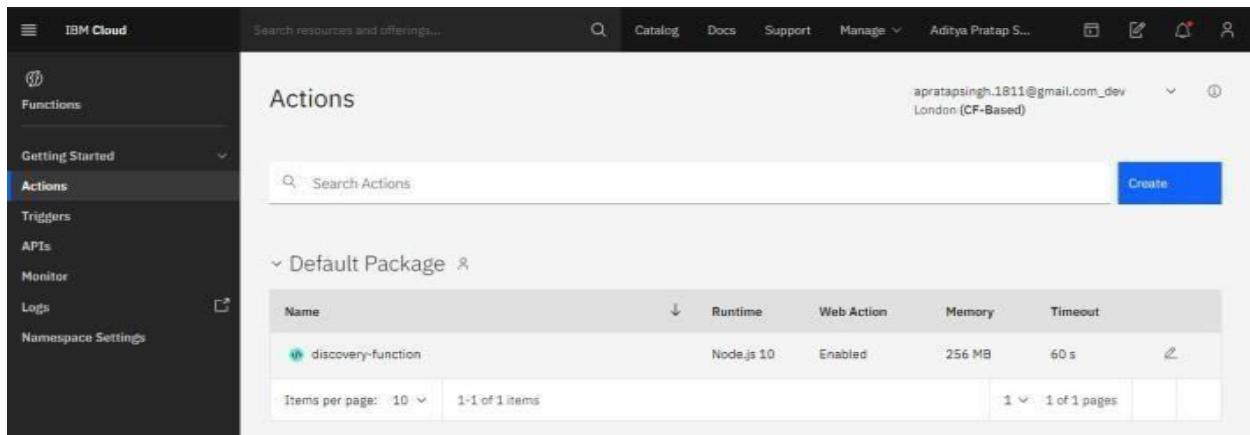


Fig:08-IBM Cloud Function (Action Window)

It is used to hyperlink the invention with assistant, so that our queries may be replied via the discovery. After deciding on the movement from the IBM catalog, we should click on the movement tab as proven on the left menu. Here we made the Information characteristic.



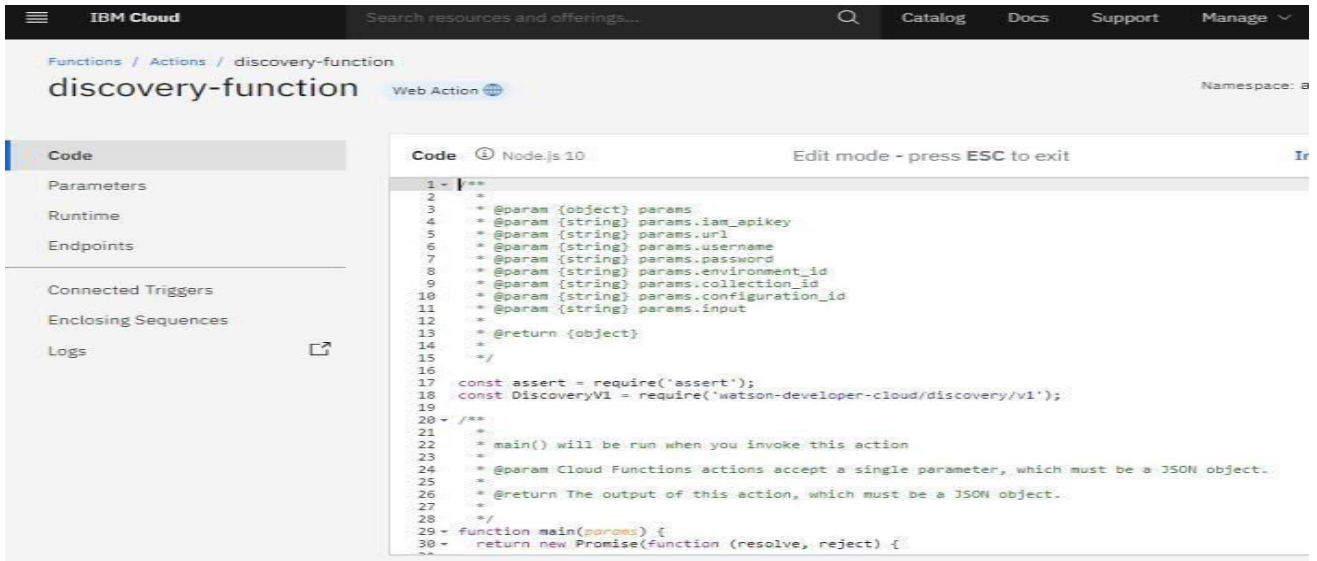


Fig:09-IBM Cloud Function (Code window)

We can make the parameters as in step with the code and paste the parameter price from the invention credentials. After that, we should click on the endpoint and allow the web movement so as to generate a public URL and it will be similarly used.

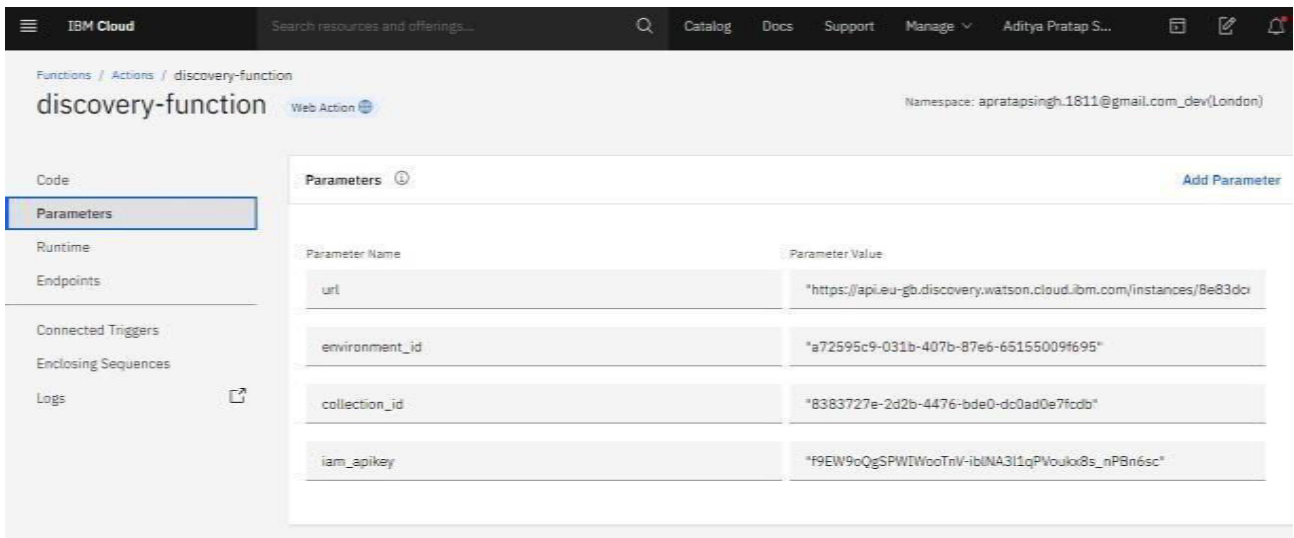


Fig:10-IBM Cloud Function (Parameter window)

Next, we must make the Watson assistant and use the sample patron care talent for comfort. We can upload purpose associated with product records and the related entities and conversation go with the flow.

- Intents- These are the categories which we mention, or we count on the user input to be, for instance: Greetings may be an rationale and in it we can have examples as Good Morning, Good Evening and all.
- Entities- These are used to mention the usual typos of the user and the synonyms like some people write the good morning as gm, correct morning, gud morning, so we will cover most of these also as opposed to returning a message to rephrase.
- Dialog- Here we point out the outputs to be given, those may be static as well as dynamic.
- Next, we have to mention the URL that we got earlier
- We must enable the webhooks which enables our dialog to send a POST request to the webhook URL

- After this we have to make the node-red flow, and link everything. We will get a UI from the node. The roles of different nodes understood by the references mentioned in in the end.

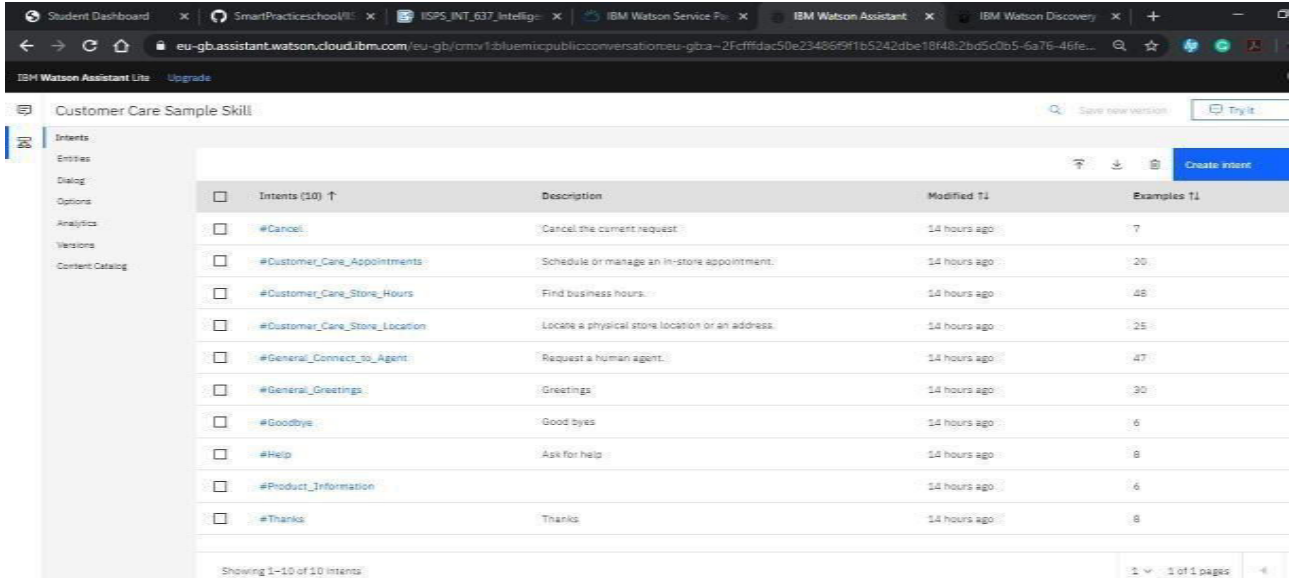


Fig:11-Watson Assistant window

## VI. RESULT

The UI we have is the simple one but can be stepped forward by using writing the HTML code inside the template node. We can vary the heritage shade also from the node-crimson. This is how the initial waft gave the impression of but we imported some other waft simply to enhance the UI. This simple flow may be prolonged to what we've got used subsequent, we've got imported the go with the flow to make thigs easy and to have an exciting UI.

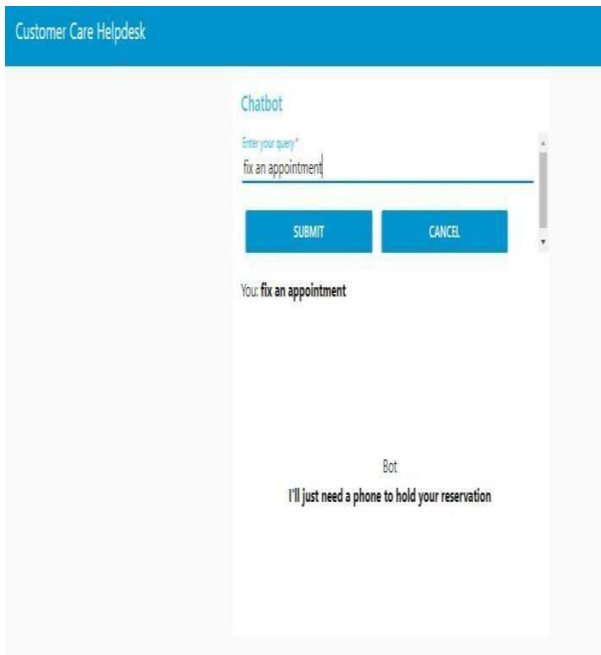


Fig:12(a)- Node-RED Window

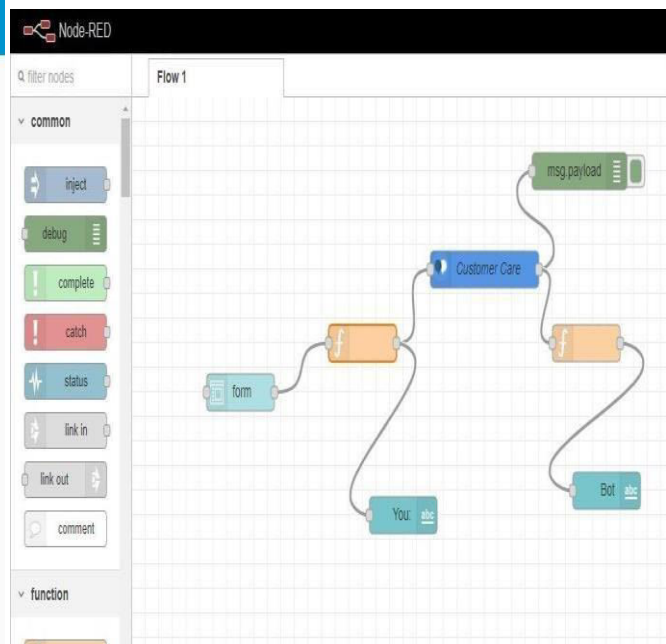


Fig:13(b)- ChatBot UI (Result Window)

## VII. FUTURE SCOPE

We can import the pre-built node-red flow and can improve our UI, moreover we can make a data base and use it to show the recent chats to the customer.

- We can also improve the results of discovery by enriching it with more fields and doing the Smart Data Annotation more accurately.
- We can get the premium version to increase the scope of our chatbot in terms of the calla and request.

## VIII. CONCLUSION

By following the above-mentioned steps, we can create a simple chatbot that may assist us to answer the primary questions of the client or user related to place of the office, running hours and the facts about the product. We effectively create the intelligent helpdesk clever chatbot the usage of Watson Assistant, Watson Cloud Function, Watson Discovery, and Node-Re

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## BIOGRAPHY

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