PROJECT REPORT

Intelligent Customer Help Desk with Smart Documentation Understanding

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Category: Internet of Things

CONTENTS

1. Introduction

1.1 Overview

We will be able to write an application that leverages multiple Watson AI services like Discovery, Assistant, Cloud Function, and Node-Red. By the end of the project we will learn best practices of combining Watson Services, and how they can build an 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
- Project Deliverables: Smartinternz Internship
- Project Duration: 1 Month

1.2 Purpose

The chatbot, as a rule, can respond to simply straightforward inquiries, for example, store areas and hours, bearings and perhaps making arrangements. At the point when any client input (question) drops out of the extent of the foreordained inquiry set of a chatbot, it ordinarily instructs us to rethink our sentence or notice that this inquiry isn't legitimate.

In this undertaking we will accentuate to diminish the remaining task at hand from the agent by directing our chatbot so that it can respond to a significant part of the inquiries (specifically the item data). We can restore the significant areas from the client direct which can assist us with reducing the number of customers of each agent at a call place. We will move the call to delegates specifically cases as it were. To make this a stride further, the undertaking will utilize the Smart Document Understanding gave by the Watson Discovery to prepare on the content, which is an adjusted form of Natural Language Processing.

Scope of Work:

- Create a customer care dialog skill in Watson Assistant.
- Use smart document understanding to build an enhanced Watson Discovery Collection
- Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery
- Build a web application with integration to all these services & deploy the same on IBM Cloud Platform

2. Literature Survey

2.1 Existing Problem

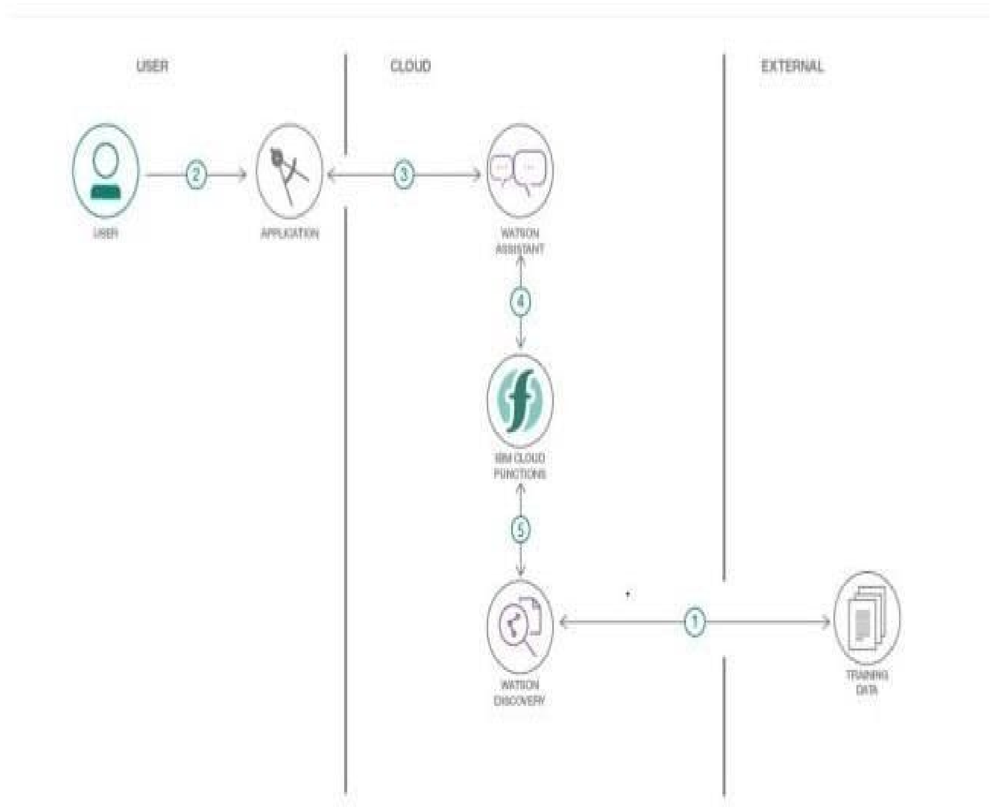
For the most part, chatbot are stacked with a specific arrangement of inquiries that is increasingly similar to if and else stream, the inquiry or the client input which lies out of the extent of the chatbot isn't replied and rather a message like "Attempt again in the wake of rethinking" and "I can't see, Please Rephrase" are shown and it guides the client to the client specialist or the agent however a productive chatbot ought to lessen the traffic coming to the delegates, So to accomplish this we incorporate a Smart chatbot so it can answer the questions of the client.

2.2 Proposed Solution

For the previously mentioned issue, we need to place a virtual specialist in chatbot so it can comprehend the questions that are posted by clients. The virtual operator ought to be prepared from some knowledge dependent on organization foundations, working hours, store areas, and item-related data. In this undertaking I utilized Watson Discovery to accomplish the above arrangement.

3. Theoretical Analysis

3.1 Block/Flow Diagram



1. The report is explained utilizing Watson Discovery SDU.
2. The client interfaces with the backend server by means of the application UI. The frontend application UI is a chatbot that draws in the client in a discussion.
3. The exchange between the client and backend server is facilitated by utilizing a Watson Assistant discourse ability.
4. On the off chance that the client asks the item activity inquiry, a pursuit question is passed to a predefined IBM Cloud Function activity.
5. Cloud work activity will inquiry the Watson Discovery administration and return the outcomes

3.2 Hardware/Software Designing

- Create IBM Cloud services.
- Configure Watson Discovery
- Create IBM Cloud Function action
- Configure Watson Assistant
- Create flow and configure the node
- Deploy and run a node-red app

4. Experimental Investigation

1) **Create IBM Cloud Services**
   a. Watson Discovery
   b. Watson Assistant
   c. Node-Red
2) **Configure Watson Discovery**

In the wake of making and propelling the disclosure from the Catalog, Import the report on which we have to prepare the revelation administration. We have chosen the ecobee3 client manage situated in the information registry of our neighborhood store.

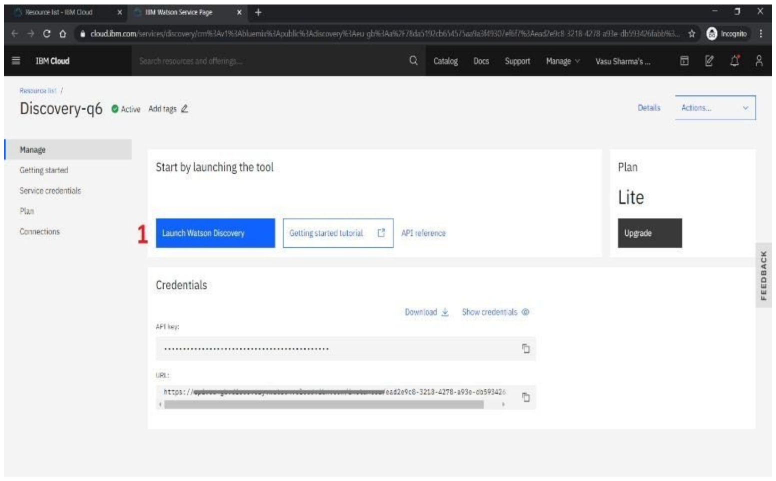
The Ecobee3 is a well known private indoor regulator that has a WIFI interface and numerous design choices. The consequence of the questions performed without arranging the information present in the archive won't be that precise. Be that as it may, the outcomes improve fundamentally in the wake of applying SDU (Smart Document Understanding).

This should be possible effectively by tapping on the design setting and afterward marking each word or component present in the record as their individual name, for example, title, caption, content, picture, and Footer. A portion of the names is absent in the light arrangement.

In the light arrangement we are given the constrained substance of IBM Watson, the names help us in a division of the report which causes the disclosure to comprehend the record better and give better outcomes. The outcomes gave by the revelation can be improved, all the outcomes have appeared in aide in which the disclosure sees the assumption as positive for example coordinating between the inquiry or question entered by the client and the information of the record. Better the notion investigation precise the outcomes are.

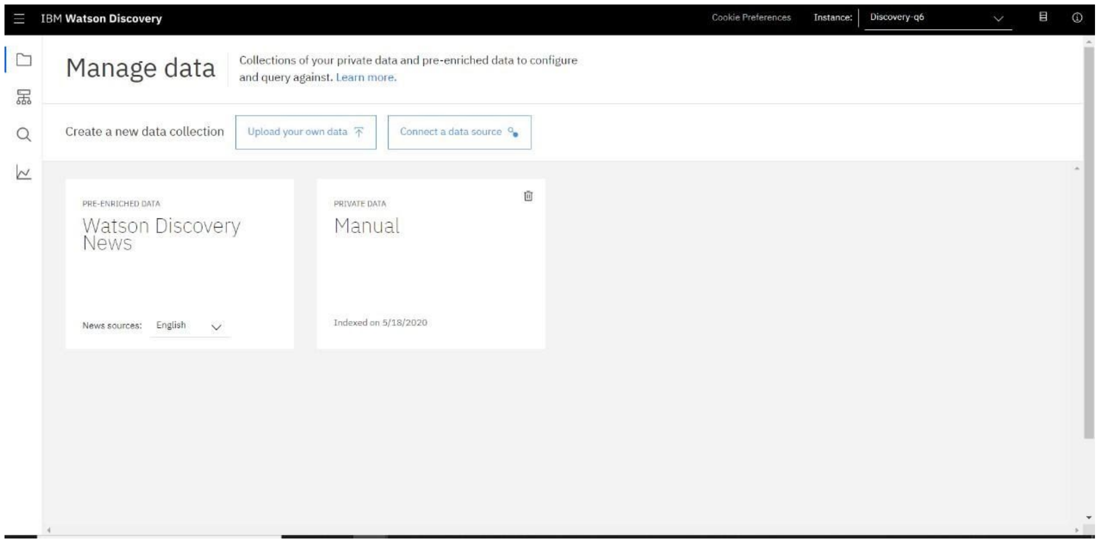
Follow the below-mentioned steps:

- After creating 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 is mentioned. These credentials will be used in further steps.

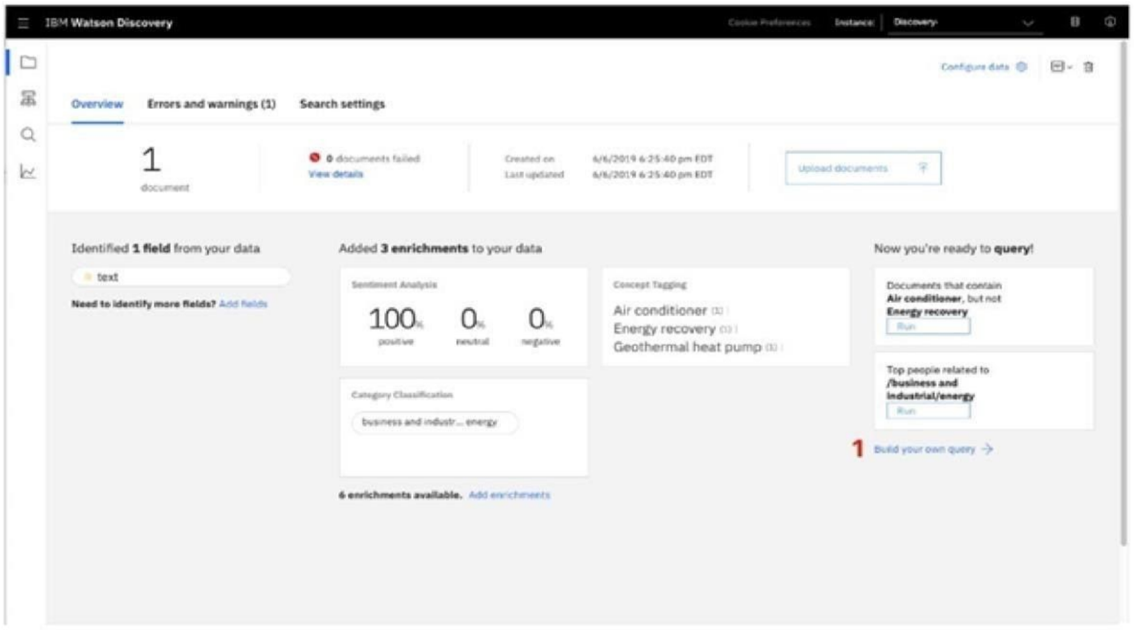


Click on the Launch Watson Discovery [1] to launch the discovery.

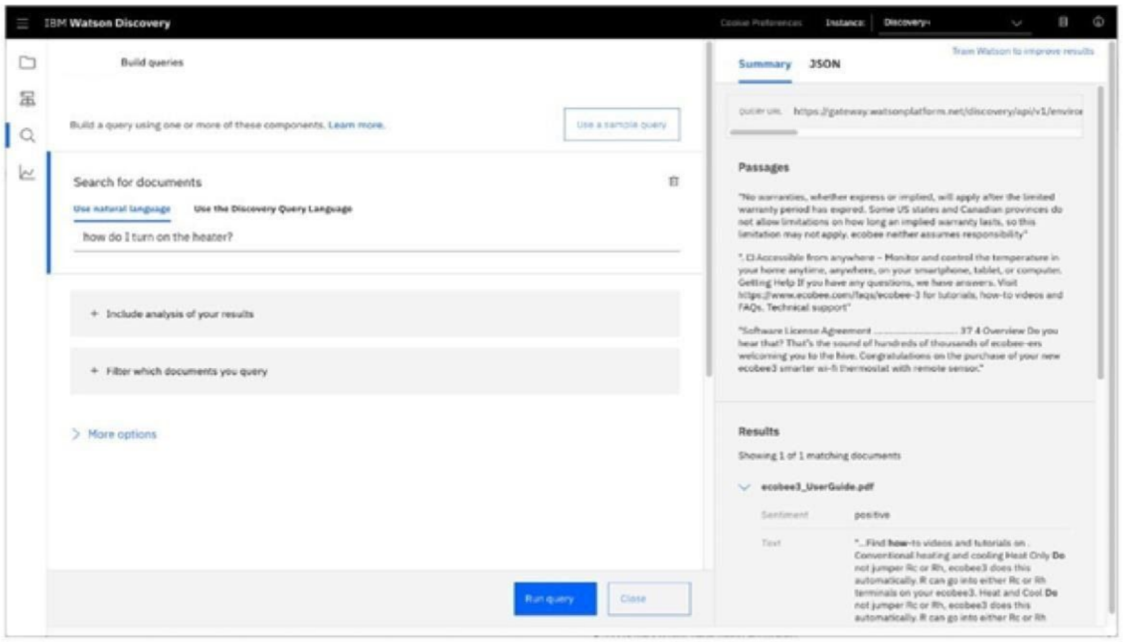
- Now in the next step we have to upload the data by clicking, upload your data. Here we have already uploaded the data as manual.



- After uploading the document we will see the page like this, we can ignore the warnings section as it is due to the normalization process and is of no worry. Now click on the build your own query, so that we can have an idea of how the results have significantly improved after configuring the data.


IBM Watson Discovery
Cookie Preferences
Instance:
Discovery
Configure data
Overview
Errors and warnings (1)
Search settings
1
document
0 documents failed
View details
Created on 6/6/2019 6:25:40 pm EDT
Last updated 6/6/2019 6:25:40 pm EDT
Upload documents
Identified 1 field from your data
text
Need to identify more fields? Add fields
Added 3 enrichments to your data
Sentiment Analysis
100% positive
0% neutral
0% negative
Concept Tagging
Air conditioner
Energy recovery
Geothermal heat pump
Category Classification
business and industr... energy
6 enrichments available. Add enrichments
Now you're ready to query!
Documents that contain Air conditioner, but not Energy recovery
Run
Top people related to /business and industrial/energy
Run
1
Build your own query

- Enter the queries related to the thermostat and view the results. As you will see, the results are not very useful and not even that relevant. The next step is to annotate the document with SDU.


IBM Watson Discovery
Cookie Preferences
Instance:
Discovery
Build queries
Build a query using one or more of these components. Learn more.
Use a sample query
Search for documents
Use natural language
Use the Discovery Query Language
+ Include analysis of your results
+ Filter which documents you query
More options
Run query
Close
Train Watson to improve results
Summary
JSON
Passages
Results
Sentiment
Text

how do I turn on the heater?

Query URL https://gateway.watsonplatform.net/discovery/api/v1/enviro

"No warranties, whether express or implied, will apply after the limited warranty period has expired. Some US states and Canadian provinces do not allow limitations on how long an implied warranty lasts, so this limitation may not apply. ecobee neither assumes responsibility"

". ☐ Accessible from anywhere – Monitor and control the temperature in your home anytime, anywhere, on your smartphone, tablet, or computer. Getting Help If you have any questions, we have answers. Visit https://www.ecobee.com/faqs/ecobee-3 for tutorials, how-to videos and FAQs. Technical support"

"Software License Agreement .... 37 4 Overview Do you hear that? That's the sound of hundreds of thousands of ecobee-ers welcoming you to the hive. Congratulations on the purchase of your new ecobee3 smarter wi-fi thermostat with remote sensor."

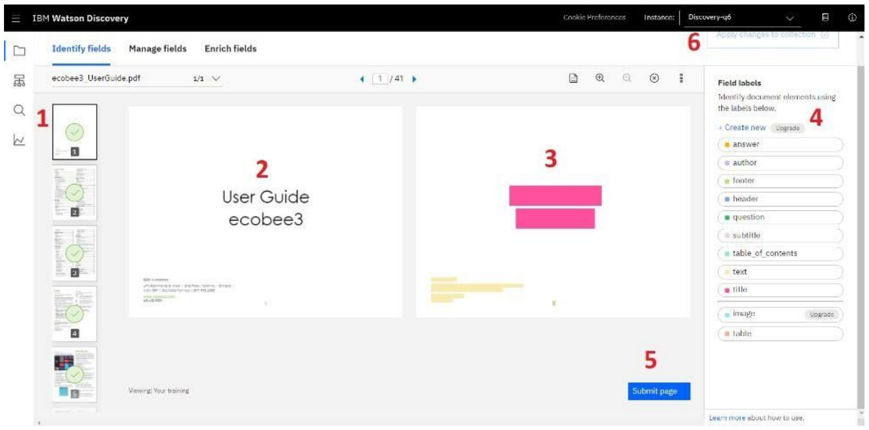
Showing 1 of 1 matching documents

ecobee3_UserGuide.pdf

Sentiment: positive

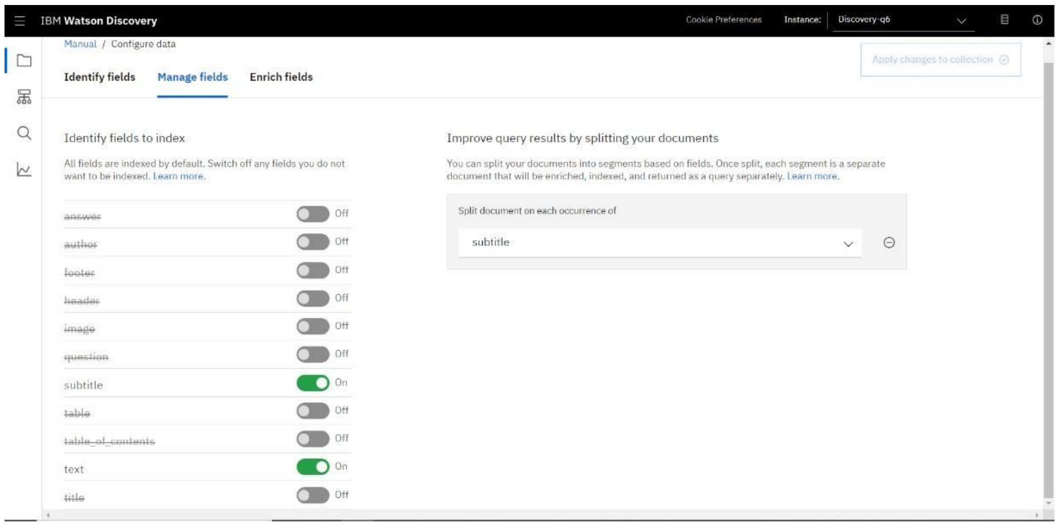
Text: "...Find **how**-to videos and tutorials on . Conventional heating and cooling Heat Only **Do** not jumper Rc or Rh, ecobee3 does this automatically. R can go into either Rc or Rh terminals on your ecobee3. Heat and Cool **Do** not jumper Rc or Rh, ecobee3 does this automatically. R can go into either Rc or Rh

- Below is the layout of Identify fields tab of the SDU annotation panel:



The point is to comment on all the pages of the record, with the goal that disclosure can realize what content is significant and what content can be overlooked. is the rundown of pages we have in the report. In the light arrangement we can't transfer a record in excess of 50,000 words and any archive with more than that will be cut to this range. is the present page being annotated.is the page wherein we need to give a mark to every content, for instance as appeared above we have the Title and content, at the base we have the footer. is the rundown of marks we can give in which the picture name isn't accessible in the light plan.We need to tap the submit page button subsequent to commenting on each page separately, after hardly any pages the disclosure will naturally give the name to the rest of the pages. Snap-in the wake of finishing the explanation of the record.

- For additional division and making the sub-records, we need to deal with the fields. Here we are given the choice of distinguishing field to file for example what all writings are significant for us, as should be obvious in the beneath cut, we have turned on just caption and content since they are the main 2 names where we are intrigued. On the correct side we have the choice parting the archive according to the decision of our name. We have chosen caption here. This can fluctuate according to various requirements of the client.



IBM Watson Discovery | Cookie Preferences | Instance: Discovery-q6

Manual / Configure data

Identify fields | **Manage fields** | Enrich fields

Apply changes to collection

Identify fields to index

All fields are indexed by default. Switch off any fields you do not want to be indexed. Learn more.

~~answer~~	Off
~~author~~	Off
~~footer~~	Off
~~header~~	Off
~~image~~	Off
~~question~~	Off
subtitle	On
~~table~~	Off
~~table_of_contents~~	Off
text	On
~~title~~	Off

Improve query results by splitting your documents

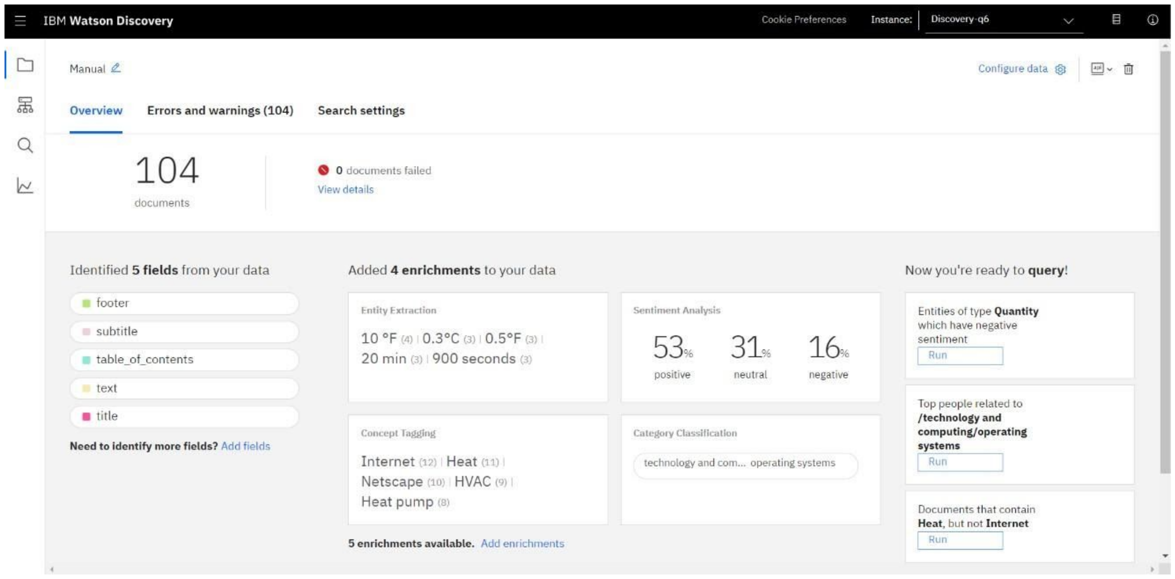
You can split your documents into segments based on fields. Once split, each segment is a separate document that will be enriched, indexed, and returned as a query separately. Learn more.

Split document on each occurrence of

subtitle

After doing everything as mentioned above, we have to click on Apply changes to Collection.

- It will take some time to process and after that, we will have multiple documents as shown below, the document we uploaded earlier is segmented in 104 documents as shown below.



IBM Watson Discovery | Cookie Preferences | Instance: Discovery-q6

Manual

Configure data

Overview | Errors and warnings (104) | Search settings

104 documents

0 documents failed
View details

Identified **5 fields** from your data

- footer
- subtitle
- table_of_contents
- text
- title

Need to identify more fields? Add fields

Added **4 enrichments** to your data

Entity Extraction
10 °F (4) | 0.3°C (3) | 0.5°F (3) |
20 min (3) | 900 seconds (3)

Sentiment Analysis
53% positive | 31% neutral | 16% negative

Concept Tagging
Internet (12) | Heat (11) |
Netscape (10) | HVAC (9) |
Heat pump (8)

Category Classification
technology and com... operating systems

5 enrichments available. Add enrichments

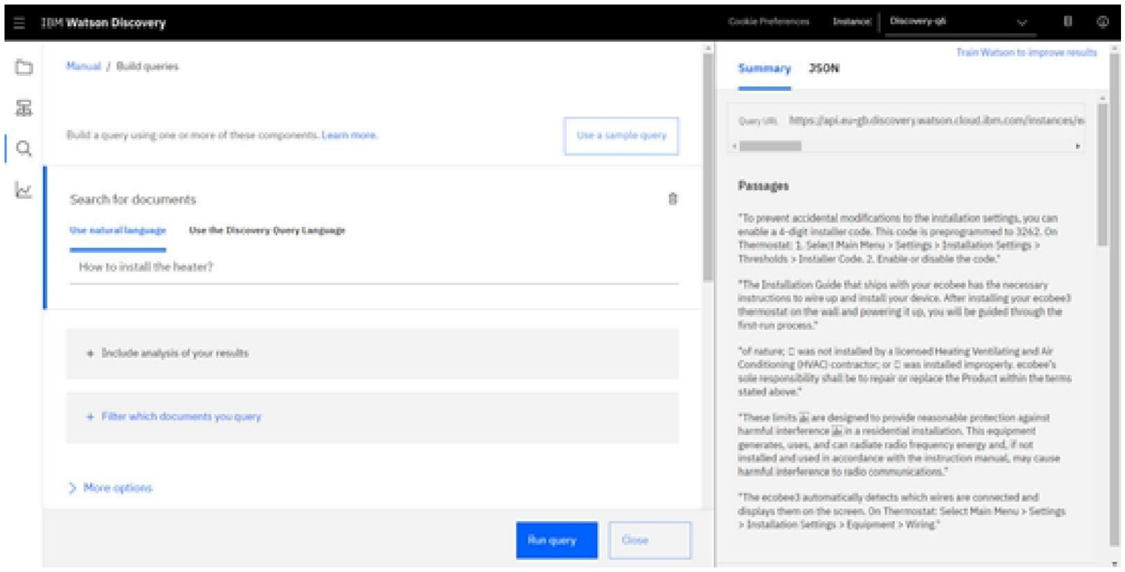
Now you're ready to **query**!

Entities of type **Quantity** which have negative sentiment
Run

Top people related to **/technology and computing/operating systems**
Run

Documents that contain **Heat**, but not **Internet**
Run

- Return to the query panel and try to build the same query as earlier and check the result. We will observe an improved result.



Build a query using one or more of these components. Learn more.

How to install the heater?

https://api.eu-gb.discovery.watson.cloud.ibm.com/instances/e

"To prevent accidental modifications to the installation settings, you can enable a 4-digit installer code. This code is preprogrammed to 3262. On Thermostat: 1. Select Main Menu > Settings > Installation Settings > Thresholds > Installer Code. 2. Enable or disable the code."

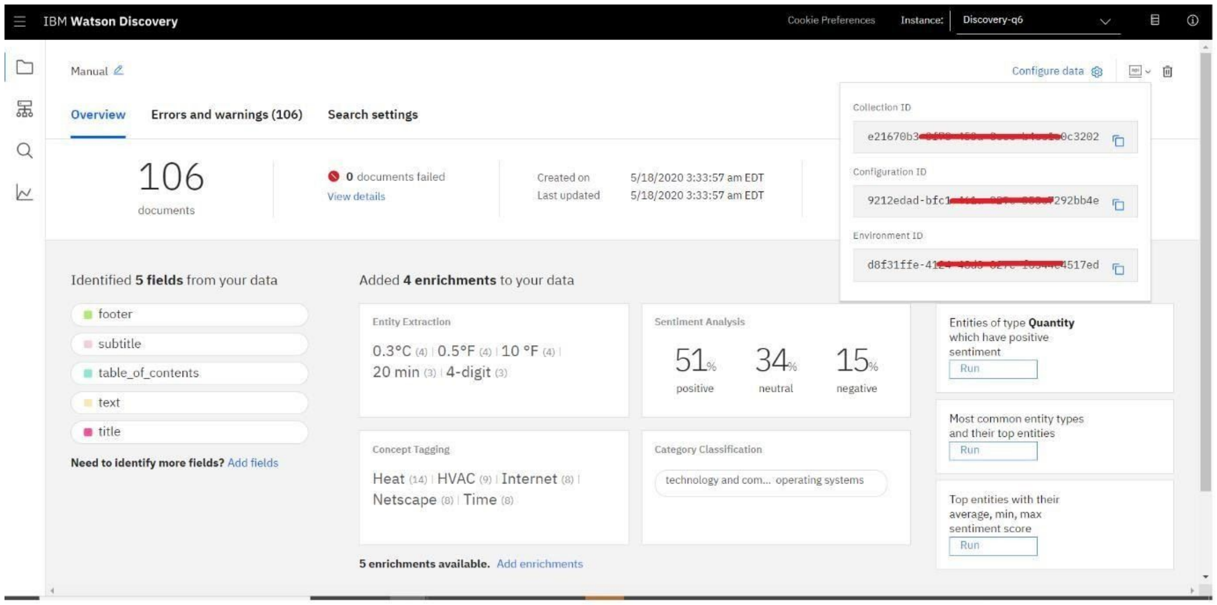
"The Installation Guide that ships with your ecobee has the necessary instructions to wire up and install your device. After installing your ecobee3 thermostat on the wall and powering it up, you will be guided through the first-run process."

"of nature; □ was not installed by a licensed Heating Ventilating and Air Conditioning (HVAC) contractor; or □ was installed improperly. ecobee's sole responsibility shall be to repair or replace the Product within the terms stated above."

"These limits □ are designed to provide reasonable protection against harmful interference □ in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications."

"The ecobee3 automatically detects which wires are connected and displays them on the screen. On Thermostat: Select Main Menu > Settings > Installation Settings > Equipment > Wiring."

- Next, we have to store the credentials of Discovery which can be viewed as shown below:



Collection ID: e21670b3[redacted]0c3202

Configuration ID: 9212edad-bfc1[redacted]292bb4e

Environment ID: d8f31ffe-41[redacted]4517ed

106 documents

0 documents failed

Created on 5/18/2020 3:33:57 am EDT
Last updated 5/18/2020 3:33:57 am EDT

Identified 5 fields from your data
- footer
- subtitle
- table_of_contents
- text
- title

Need to identify more fields? Add fields

Added 4 enrichments to your data

Entity Extraction: 0.3°C (4) | 0.5°F (4) | 10 °F (4) | 20 min (3) | 4-digit (3)

Sentiment Analysis: 51% positive, 34% neutral, 15% negative

Concept Tagging: Heat (14) | HVAC (9) | Internet (8) | Netscape (8) | Time (8)

Category Classification: technology and com... operating systems

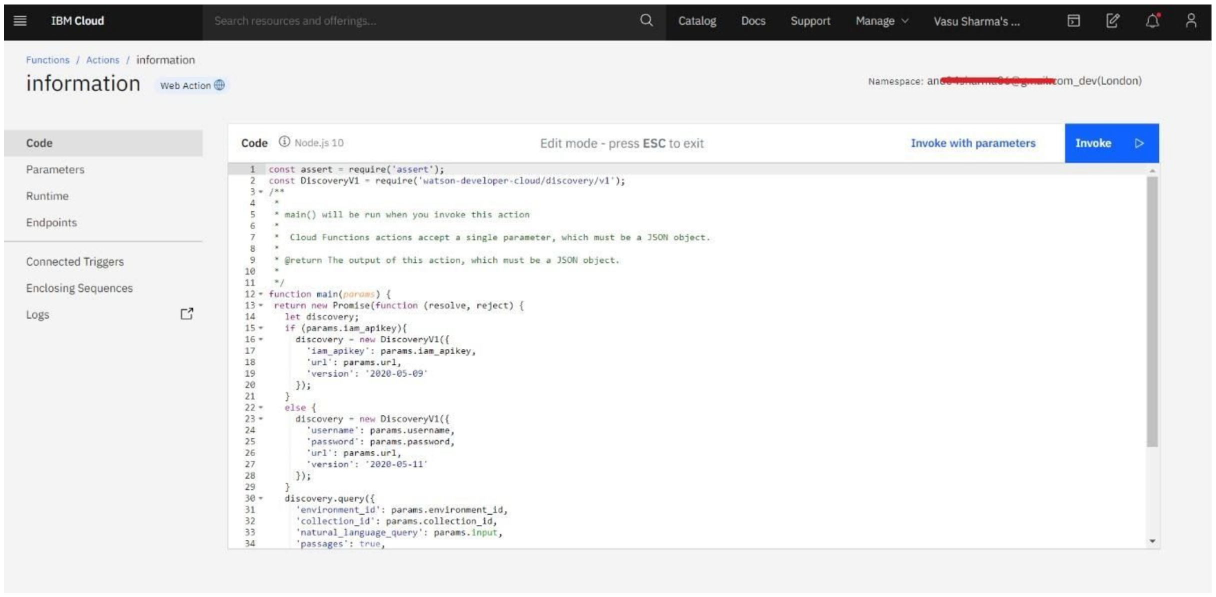
5 enrichments available. Add enrichments

Entities of type Quantity which have positive sentiment

Most common entity types and their top entities

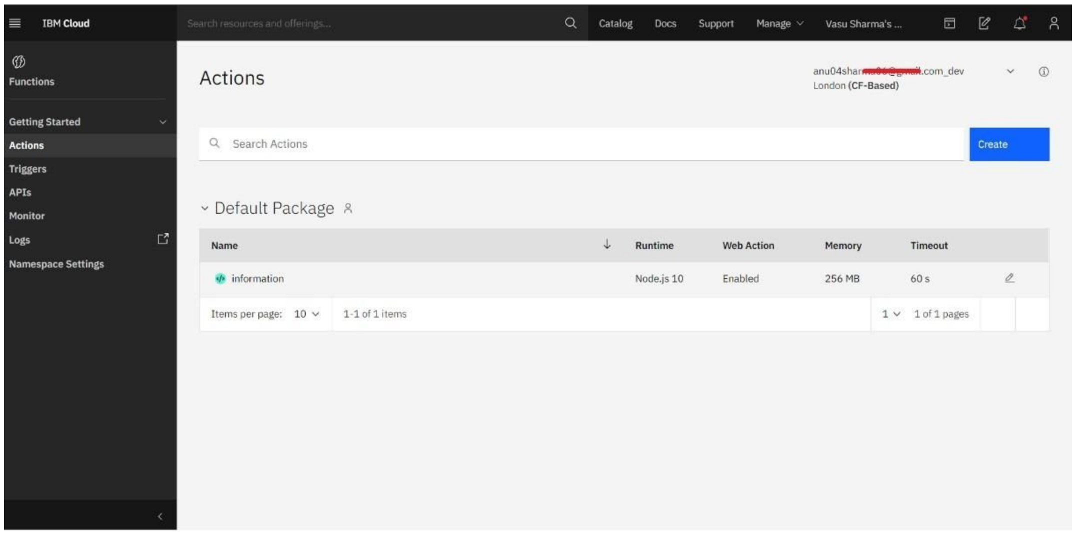
Top entities with their average, min, max sentiment score

- We already have the API key and the URL.
- Next, we have to create the IBM Cloud Function Action:
  It is used to link the discovery with an assistant so that our queries can be answered by the discovery. After selecting the action from the IBM catalog, we have to click on the action tab as shown on the left menu. Here we made the Information function. Then we can post the code which will help us to link the discovery.



Namespace: an[redacted]om_dev(London)

```
const assert = require('assert');
const DiscoveryV1 = require('watson-developer-cloud/discovery/v1');
/**
 *
 * main() will be run when you invoke this action
 *
 *  Cloud Functions actions accept a single parameter, which must be a JSON object.
 *
 * @return The output of this action, which must be a JSON object.
 *
 */
function main(params) {
 return new Promise(function (resolve, reject) {
   let discovery;
   if (params.iam_apikey){
     discovery = new DiscoveryV1({
       'iam_apikey': params.iam_apikey,
       'url': params.url,
       'version': '2020-05-09'
     });
   }
   else {
     discovery = new DiscoveryV1({
       'username': params.username,
       'password': params.password,
       'url': params.url,
       'version': '2020-05-11'
     });
   }
   discovery.query({
     'environment_id': params.environment_id,
     'collection_id': params.collection_id,
     'natural_language_query': params.input,
     'passages': true,
```

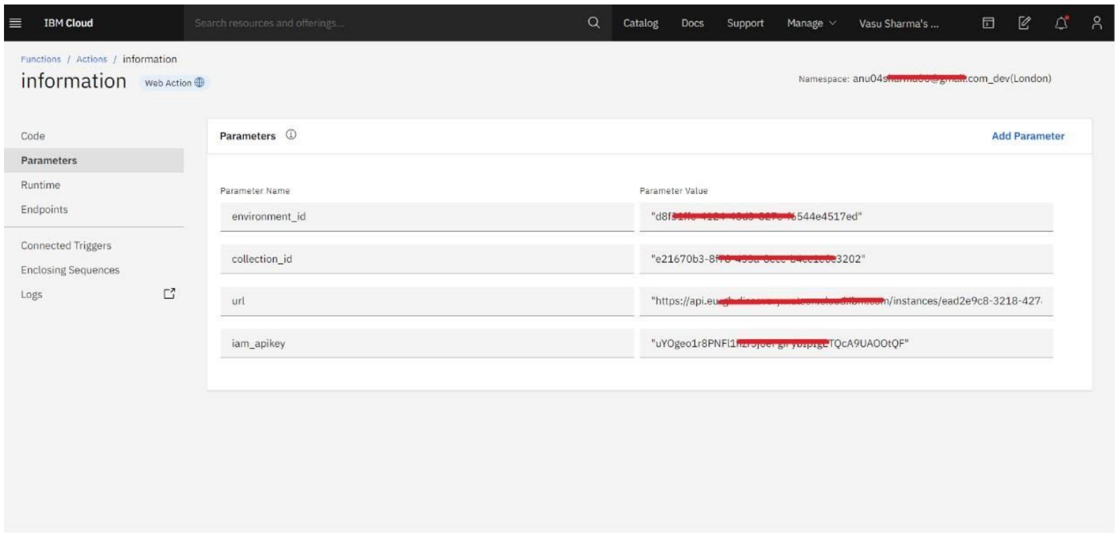


anu04shar[redacted].com_dev
London (CF-Based)

Name	Runtime	Web Action	Memory	Timeout
information	Node.js 10	Enabled	256 MB	60 s

Items per page: 10 1-1 of 1 items 1 1 of 1 pages

We can make the parameters as per the code and paste the parameter value from the discovery credentials. After that we have to click on the endpoint and enable the web action which will generate a public URL and it will be further used.



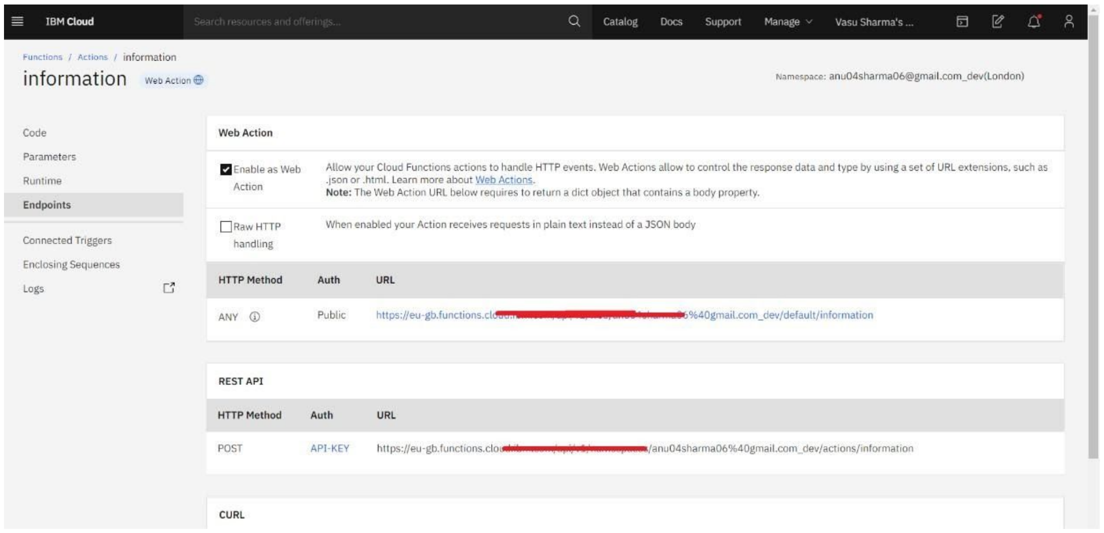
Functions / Actions / information

information Web Action

Namespace: anu04s[redacted].com_dev(London)

Parameters

Parameter Name	Parameter Value
environment_id	"d8f[redacted]5544e4517ed"
collection_id	"e21670b3-8f[redacted]3202"
url	"https://api.eu[redacted]n/instances/ead2e9c8-3218-427
iam_apikey	"uYOgeo1r8PNFl1[redacted]TQcA9UAOOtQF"



Functions / Actions / information

information Web Action

Namespace: anu04sharma06@gmail.com_dev(London)

Web Action

[✓ Enable as Web Action] Allow your Cloud Functions actions to handle HTTP events. Web Actions allow to control the response data and type by using a set of URL extensions, such as .json or .html. Learn more about Web Actions.
Note: The Web Action URL below requires to return a dict object that contains a body property.

☐ Raw HTTP handling When enabled your Action receives requests in plain text instead of a JSON body

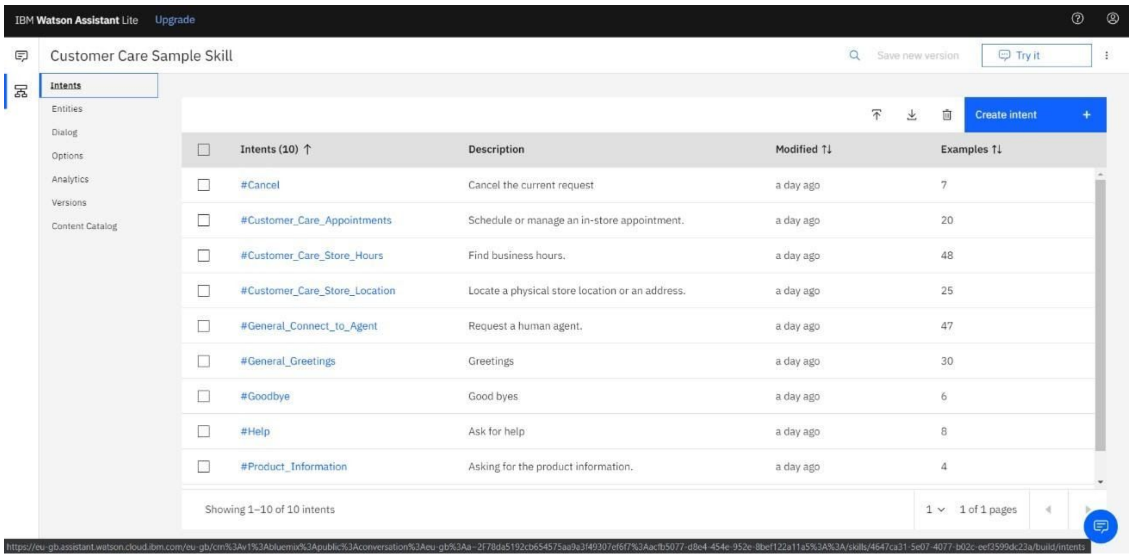
HTTP Method	Auth	URL
ANY	Public	https://eu-gb.functions.clo[redacted]6%40gmail.com_dev/default/information

REST API

HTTP Method	Auth	URL
POST	API-KEY	https://eu-gb.functions.clo[redacted]/anu04sharma06%40gmail.com_dev/actions/information

CURL

- Next, we have to make the Watson assistant and use the sample customer care skill for convenience. We can add intent related to product information and the related entities and dialog flow.
  Intents- These are the categories that we mention or we expect the user input to be, for example Greetings can be intent 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, good morning, good morning, so we can cover all these also instead of returning a message to rephrase.
  Dialog- Here we mention the outputs to be given, these can be static as well as dynamic.


IBM **Watson Assistant** Lite Upgrade

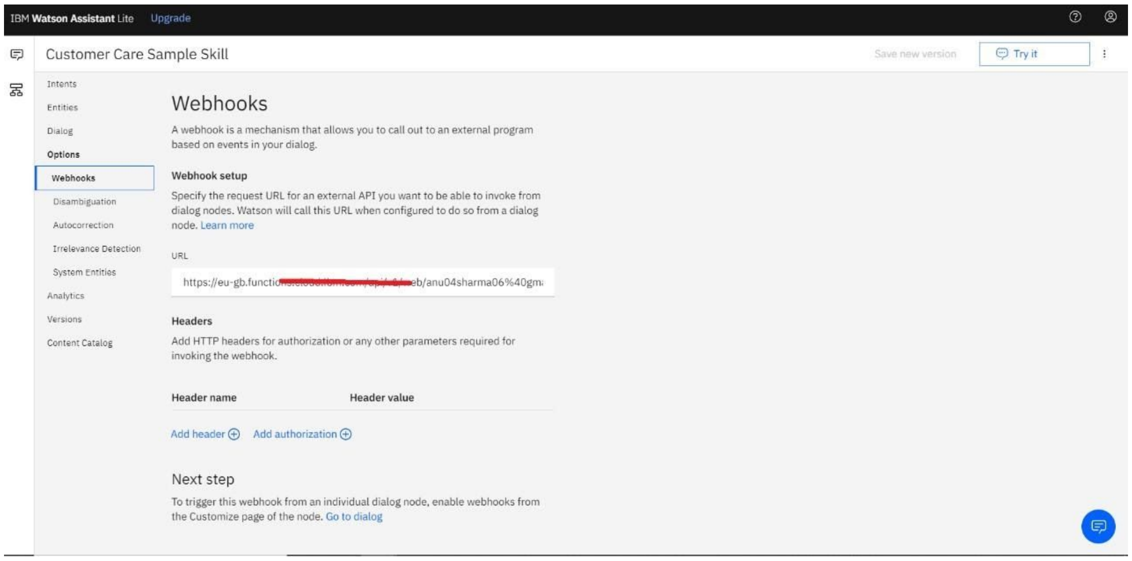
Customer Care Sample Skill

Intents (10) ↑	Description	Modified ↑↓	Examples ↑↓
#Cancel	Cancel the current request	a day ago	7
#Customer_Care_Appointments	Schedule or manage an in-store appointment.	a day ago	20
#Customer_Care_Store_Hours	Find business hours.	a day ago	48
#Customer_Care_Store_Location	Locate a physical store location or an address.	a day ago	25
#General_Connect_to_Agent	Request a human agent.	a day ago	47
#General_Greetings	Greetings	a day ago	30
#Goodbye	Good byes	a day ago	6
#Help	Ask for help	a day ago	8
#Product_Information	Asking for the product information.	a day ago	4

Showing 1–10 of 10 intents

https://eu-gb.assistant.watson.cloud.ibm.com/eu-gb/crn%3Av1%3Abluemix%3Apublic%3Aconversation%3Aeu-gb%3Aa~2F78da5192cb654575aa9a3f49307ef6f7%3Aacfb5077-d8e4-454e-952e-8bef122a11a5%3A%3A/skills/4647ca31-5e07-4077-b02c-eef3599dc23a/build/intents

- Next, we have to mention the URL that we got earlier.


IBM **Watson Assistant** Lite Upgrade

Customer Care Sample Skill

Webhooks

A webhook is a mechanism that allows you to call out to an external program based on events in your dialog.

Webhook setup

Specify the request URL for an external API you want to be able to invoke from dialog nodes. Watson will call this URL when configured to do so from a dialog node. Learn more

URL

https://eu-gb.functio[redacted]eb/anu04sharma06%40gm

Headers

Add HTTP headers for authorization or any other parameters required for invoking the webhook.

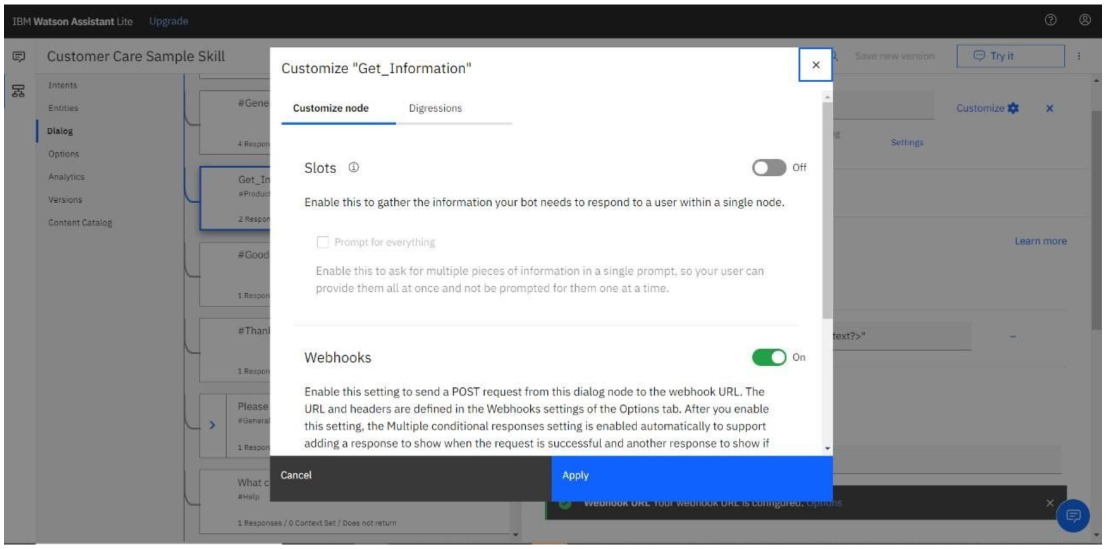
Header name	Header value

Add header ⊕ Add authorization ⊕

Next step

To trigger this webhook from an individual dialog node, enable webhooks from the Customize page of the node. Go to dialog

We have to enable the webhooks which enables our dialog to send a POST request to the webhook URL.



Customize "Get_Information"

Customize node | Digressions

Slots — Off

Enable this to gather the information your bot needs to respond to a user within a single node.

Prompt for everything

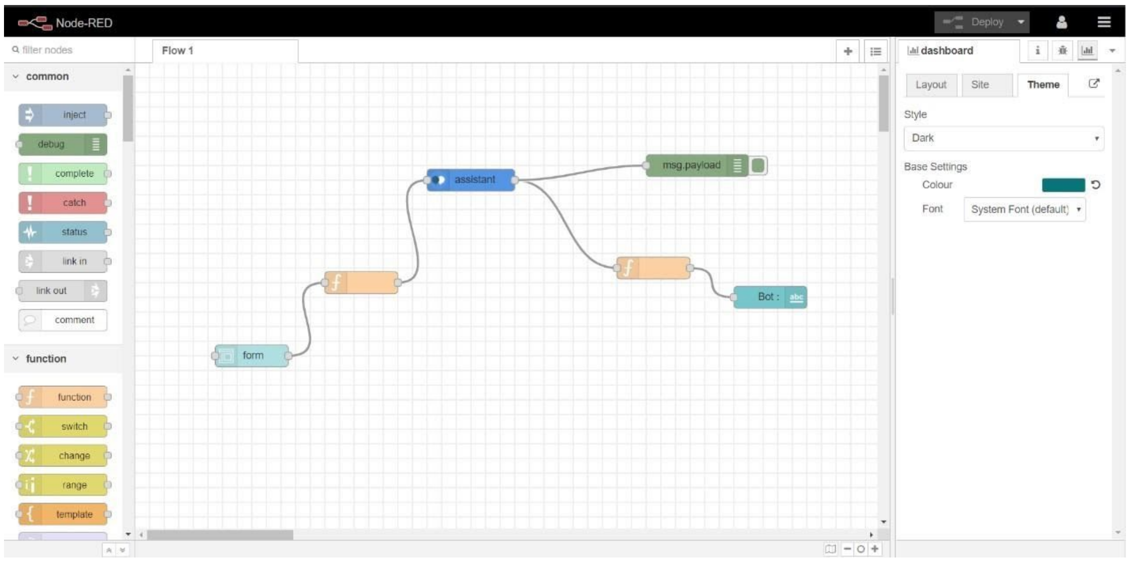
Enable this to ask for multiple pieces of information in a single prompt, so your user can provide them all at once and not be prompted for them one at a time.

Webhooks — On

Enable this setting to send a POST request from this dialog node to the webhook URL. The URL and headers are defined in the Webhooks settings of the Options tab. After you enable this setting, the Multiple conditional responses setting is enabled automatically to support adding a response to show when the request is successful and another response to show if

Webhook URL Your webhook URL is configured. Options

- 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 can be understood by the references mentioned in the end. The final flow will look like as shown below.



The UI we have is the basic one but can be improved by writing the HTML code in the template node. We can vary the background color also from the node-red.

This is how the initial flow looked like but we imported another flow just to improve the UI

This basic flow can be extended to what we have used next, we have imported the flow to make things easy and to have an interesting.

5. Flowchart

Insert the following nodes into the flow in Node-RED.

● Inject

● Debug

● ui_Form

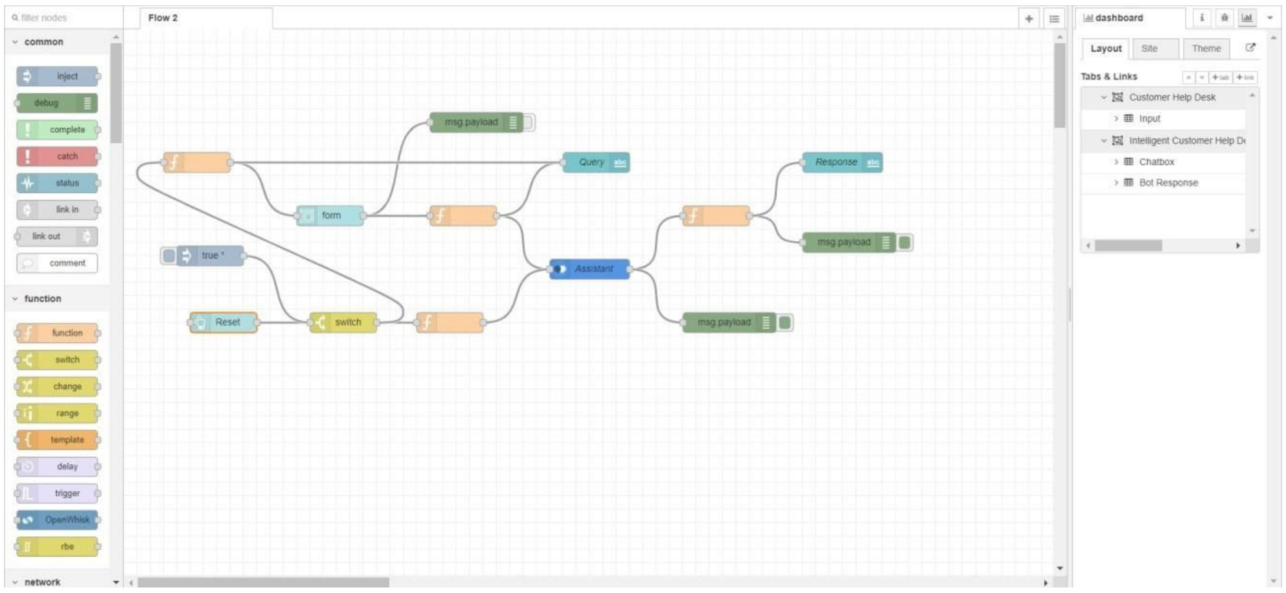
● ui_Text

● ui_Button

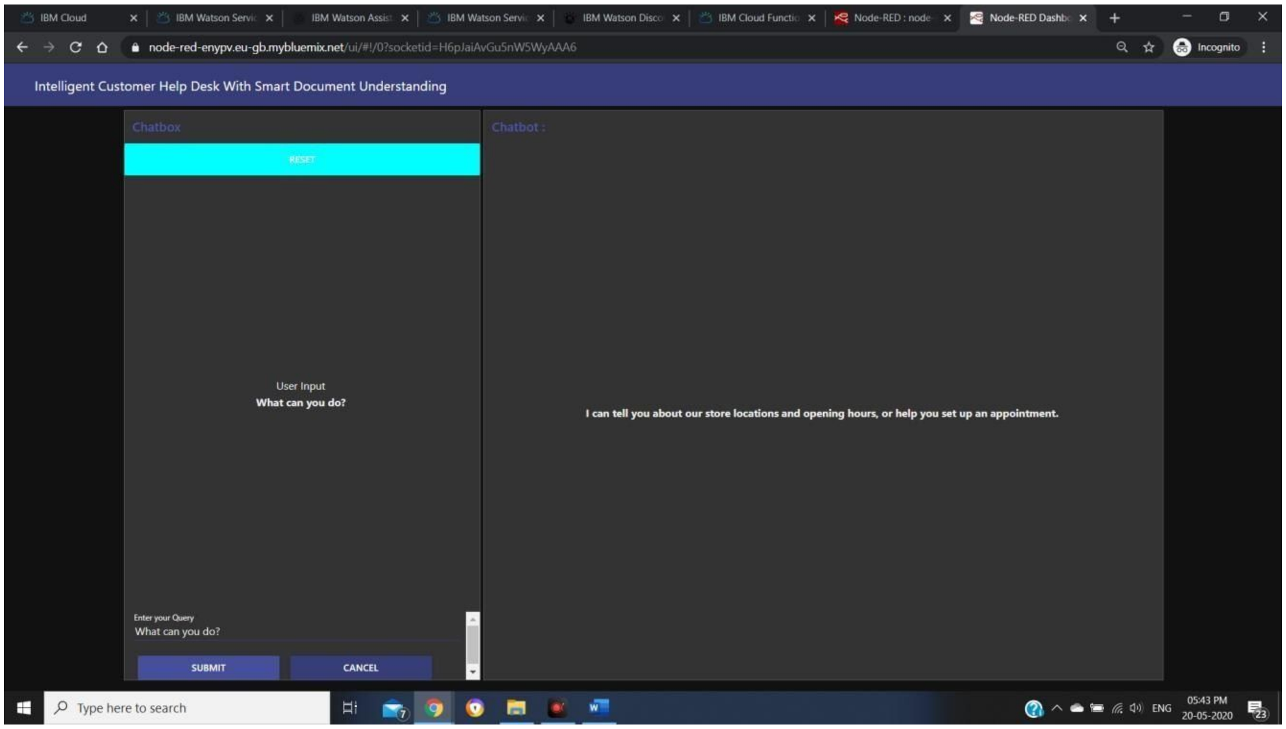
● Function

● Switch

● Assistant



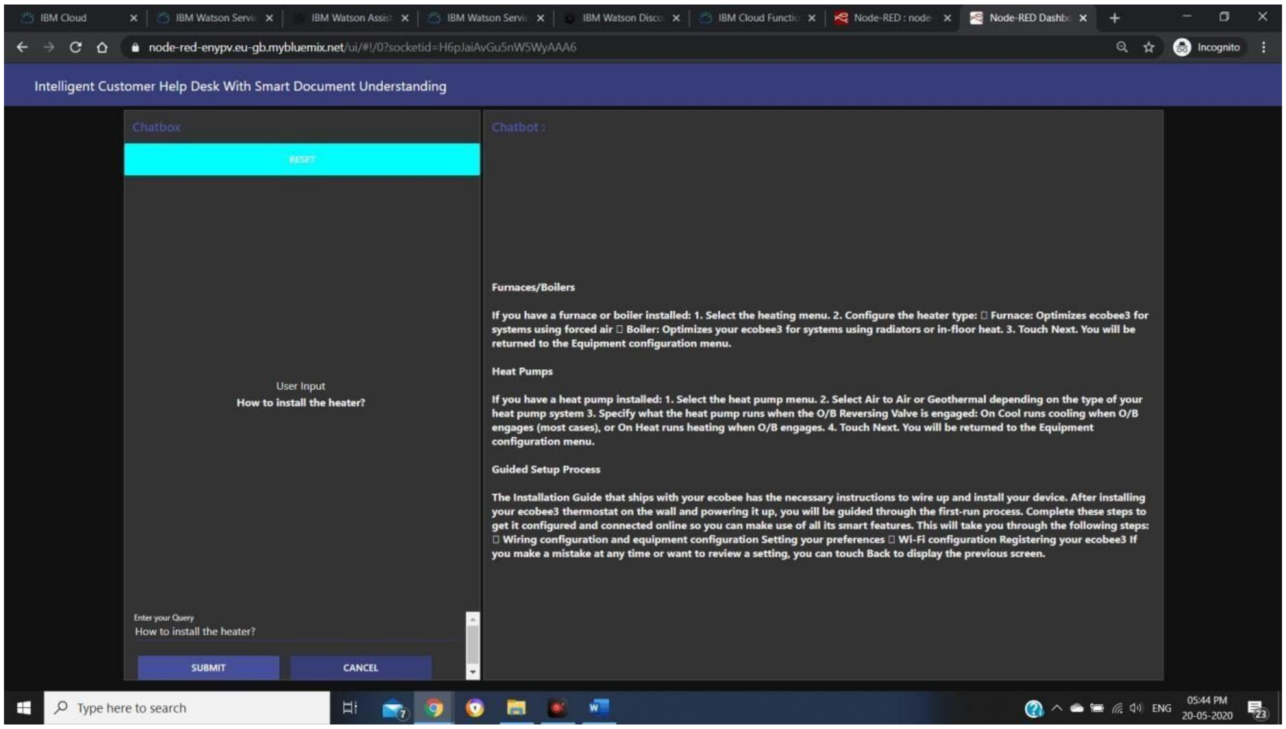
6. Result


node-red-enypv.eu-gb.mybluemix.net/ui/#!/0?socketid=H6pJaiAvGu5nW5WyAAA6
Intelligent Customer Help Desk With Smart Document Understanding
Chatbox
RESET
Chatbot :
SUBMIT
CANCEL

User Input
What can you do?

Enter your Query
What can you do?

I can tell you about our store locations and opening hours, or help you set up an appointment.


node-red-enypv.eu-gb.mybluemix.net/ui/#!/0?socketid=H6pJaiAvGu5nW5WyAAA6
Intelligent Customer Help Desk With Smart Document Understanding
Chatbox
RESET
Chatbot :
SUBMIT
CANCEL

User Input
How to install the heater?

Enter your Query
How to install the heater?

Furnaces/Boilers

If you have a furnace or boiler installed: 1. Select the heating menu. 2. Configure the heater type: Furnace: Optimizes ecobee3 for systems using forced air Boiler: Optimizes your ecobee3 for systems using radiators or in-floor heat. 3. Touch Next. You will be returned to the Equipment configuration menu.

Heat Pumps

If you have a heat pump installed: 1. Select the heat pump menu. 2. Select Air to Air or Geothermal depending on the type of your heat pump system 3. Specify what the heat pump runs when the O/B Reversing Valve is engaged: On Cool runs cooling when O/B engages (most cases), or On Heat runs heating when O/B engages. 4. Touch Next. You will be returned to the Equipment configuration menu.

Guided Setup Process

The Installation Guide that ships with your ecobee has the necessary instructions to wire up and install your device. After installing your ecobee3 thermostat on the wall and powering it up, you will be guided through the first-run process. Complete these steps to get it configured and connected online so you can make use of all its smart features. This will take you through the following steps: Wiring configuration and equipment configuration Setting your preferences Wi-Fi configuration Registering your ecobee3 If you make a mistake at any time or want to review a setting, you can touch Back to display the previous screen.

7. Advantages and Disadvantages

Advantages:

- Organizations can utilize these to diminish the workstream to the agents.
- Decrease the number of reps.
- Fewer and fewer calls will be occupied to Customer Representatives
- Lessens Man Power
- Cost Efficient.
- The decline in the number of calls occupied to delegates.
- The less outstanding burden on representatives.

Disadvantages:

- Now and then the chatbot deceives the clients.
- The disclosure returns the wrong outcomes when not appropriately designed.
- Offering the same response for various feelings.
- Now and then can't associate the client conclusions and goals
- Once in a while it can misdirect customers as it attempts to look through unessential data in the manual.
- It might likewise offer the same responses to various questions.

8. Application

- It can be deployed in popular social media applications like Facebook, Slack, and Telegram.
- A chatbot can be deployed at any website to clear the basic doubts of the customer.
- This chatbot can be conveyed to different sites as it can unravel a lot of fundamental questions.

9. Conclusion

By following the previously mentioned advances, we can make an essential chatbot which can assist us with answering the fundamental inquiries of the client or client identified with the area of the workplace, working hours and the data about the item. We effectively make the keen helpdesk brilliant chatbot utilizing Watson Assistant, Watson Cloud Function, Watson Discovery, and Node-Red.

10. Future Scope

We can import the pre-fabricated hub red stream and can improve our UI, in addition, we can make an information base and use it to demonstrate the ongoing visits to the client. We can likewise improve the aftereffects of disclosure by advancing it with more fields and doing the Smart Data Annotation all the more precisely. We can get an exceptional rendition to build the extent of our chatbot as far as the calla and solicitations.

We can likewise incorporate Watson content to sound and Speech to content administrations to get to the chatbot handsfree. These are not many things to come scopes that are conceivable.

11. Appendix

11.1 Code:

Cloud Function:

```
/**

 *

 * @param {object} params

 * @param {string} params.iam_apikey

 * @param {string} params.url

 * @param{string}params.username

 * @param{string}params.password

 * @param {string} params.environment_id

 * @param {string} params.collection_id

 * @param {string} params.configuration_id

 * @param {string} params.input

 *
 * @return {object}

 *

 */



const assert = require('assert');

const DiscoveryV1 = require('watson-developer-cloud/discovery/v1');



/**

 *

 * main() will be run when you invoke this action

 *

 * @param Cloud Functions actions accept a single parameter, which must be a JSON object.

 *

 * @return The output of this action, which must be a JSON object.

 *

 */

function main(params) {

 return new Promise(function (resolve, reject) {



   let discovery;
```

```
if (params.iam_apikey){

  discovery = new DiscoveryV1({

    'iam_apikey': params.iam_apikey,

    'url': params.url,

    'version': '2020-05-09'

  });

}

else {

  discovery = new DiscoveryV1({

    'username':

    params.username,

    'password':

    params.password, 'url':

    params.url,

    'version': '2020-05-11'

  });

}


discovery.query({
```

```
'environment_id': params.environment_id,

'collection_id': params.collection_id,
      'natural_language_query': params.input, 'passages':

      true,

      'count': 3,

      'passages_count': 3

    },function(err, data) { if

      (err)

      {

        return reject(err);

      }

      return resolve(data);

    });

  });

}
```

11.2 Bibliography

- https://www.ibm.com/cloud/architecture/tutorials/cognitive_discovery
- https://cloud.ibm.com/docs/assistant?topic=assistant-getting-started
- https://developer.ibm.com/recipes/tutorials/how-to-create-a-watson-chatbot-on-nodered/
- http://www.iotgyan.com/learning-resource/integration-of-watson-assistant-to-node-red
- https://github.com/IBM/watson-discovery-sdu-with-assistant
- https://www.youtube.com/watch?v=Jpr3wVH3FVA