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# Intelligent Customer Help Desk with Smart Document Understanding

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**Team : Jayaram R**

**Email : [www.jayaram.r.ramesh@?mail.com](mailto:www.jayaram.r.ramesh@?mail.com)**

**Organisation : TheSmartBridge**

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## 1. Project Scope, Schedule, Team & Deliverables

### **Project Summary**

A Chabot is created which has the capability to answer different sets of queries asked by the customers. Using the Watson Discovery Smart Document Understanding (SDU) feature, we will enhance the Discovery model so that queries will be better focused to only search the most relevant information found in a typical owner's manual.

The benefits of this kind of Chabot is that it is superior to the typical Chabot which can answers simple questions like store location and hours. The Chabot is upgraded with the help of Watson discovery collection which is build using smart document understanding.

If the customer question is about the operation of a device, we will use the web hook feature of Watson Assistant to pass the question onto our Watson Discovery Service, which has been pre-loaded with the device's owner's manual.

### **Project Requirements**

- IBM Cloud
- IBM Watson services
- Node Red
- Web Framework

## Functional Requirements

- A Chabot that will be able to answer queries asked by customers.
- Redirect the operational queries to Owner's manual.
- Redirect the query to the particular section of the owner's manual.

## Technical Requirements

- Using Watson Assistant create a Chabot
- Using Watson Discovery to redirect the user's query to the section of the owner's manual.
- Using Node Red to wire together API and online services.
- Integrating it with IBM Cloud.

## Software Requirements

- Web browser
- IBM Watson services
- IBM Assistant
- IBM cloud
- Github
- Node red

## Project Deliverables

Projects create deliverables, which are simply the results of the project or the processes in the project. That means a deliverable can be something as big as the objective of the project itself or the reporting that is part of the larger project.

From this project, problem statement is aimed at a Chabot would be able to identify any operational question posted by the user and using IBM Watson discovery will redirect the user to the section of the owner's manual.

## Project Team


By Jayaram R

## Project Schedule

The project is scheduled for 4 weeks

## 2. Setup The Development Environment

### Github Account



**JAYARAM R**  
JayaramR307

Edit profile

Bachelor of Technology in Computer Science. Languages: Python, C, C++, Java  
Skills/Interests: Data Science, Machine Learning, Deep Learning

Organizations

Overview Repositories 13 Projects 0 Packages 0 Stars 11 Followers 11 Following 32

Pinned

**Bank-Customer-Churn-Prediction**

To predict the propensity to churn for each customer in a bank

Jupyter Notebook

**Flutter\_Browser**

Flutter\_Browser

Dart

**Simple-Online-Shopping-Website**

Simple Online Shopping

PHP

**Crossroads2020**

Forked from MitshunSureshR/Crossroads2020

Official website of crossroads 2020

CSS ☆ 2

**Word-Cloud-Generation**


Word cloud generation using python . Use Jupyter Notebook for running code.

☆ 1

**Machine-Learning-Projets**

Jupyter Notebook

57 contributions in the last year



SmartPracticeschool / IISPS-INT-2923-Intelligent-Customer-Help-Desk-with-Smart-Documen-Understanding

Watch 1 Unstar 1 Fork 0

Branch: master IISPS-INT-2923-Intelligent-Customer-Help-Desk-with-Smart-Documen-Understanding / README.md Find file Copy path

JayaramR307 Task 1 Project Scope, Schedule, Team & Deliverables e7ced5e 2 minutes ago

1 contributor

52 lines (34 sloc) 2.14 KB Raw Blame History

## IISPS-INT-2923-Intelligent-Customer-Help-Desk-with-Smart-Documen-Understanding

- Project Scope, Schedule, Team & Deliverables

Project Summary

A chatbot is created which has the capability to answer different sets of queries asked by the customers. Using the Watson Discovery Smart Document Understanding (SDU) feature, we will enhance the Discovery model so that queries will be better focused to only search the most relevant information found in a typical owner's manual. BThe benefits of this kind of chatbot is that it is superior than the typical chatbot which can answers simple questions like store location and hours. The chatbot is

## Slack Account

smartbridgejuneal Jayaram R

People Apps Files

Channels +

- # general
- # internship
- # random
- # sps\_internship\_I12923
- # sps\_internship\_I12689
- # sps\_internship\_I12693
- # sps\_internship\_I12919

Direct messages +

- Slackbot
- Jayaram R (you)
- Lalitha Gayatri


Apps +

Jayaram R ☆

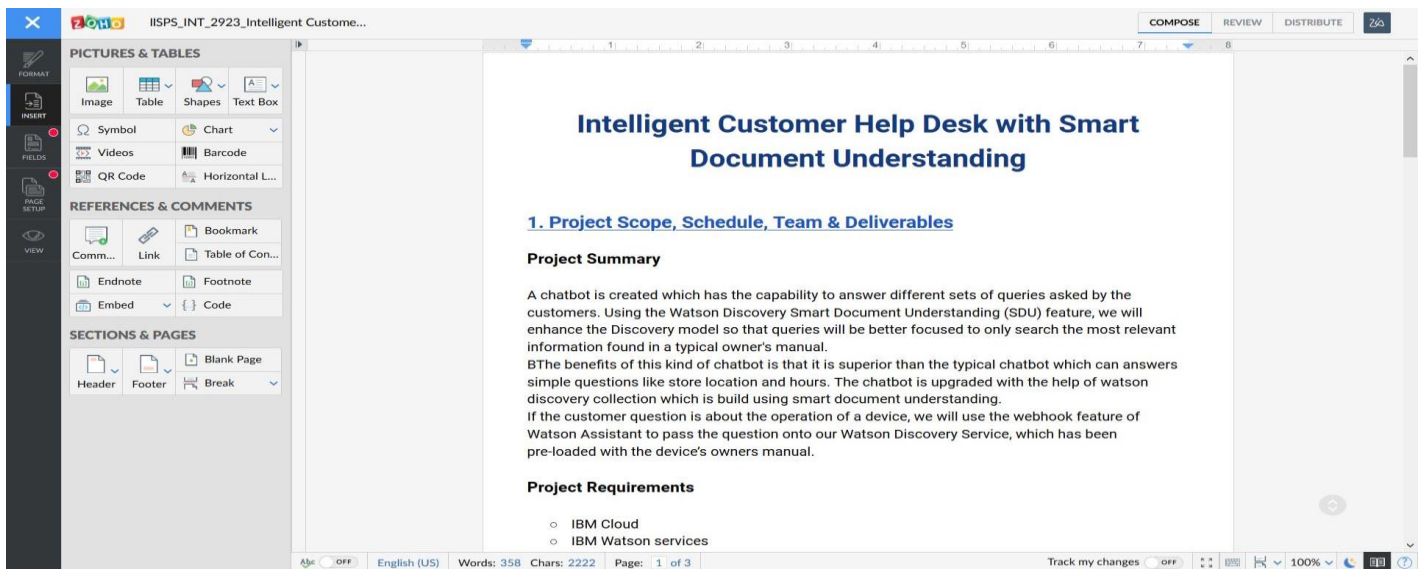
Details

This is your space. Draft messages, list your to-dos, or keep links and files handy. You can also talk to yourself here, but please bear in mind you'll have to supply both sides of the conversation.

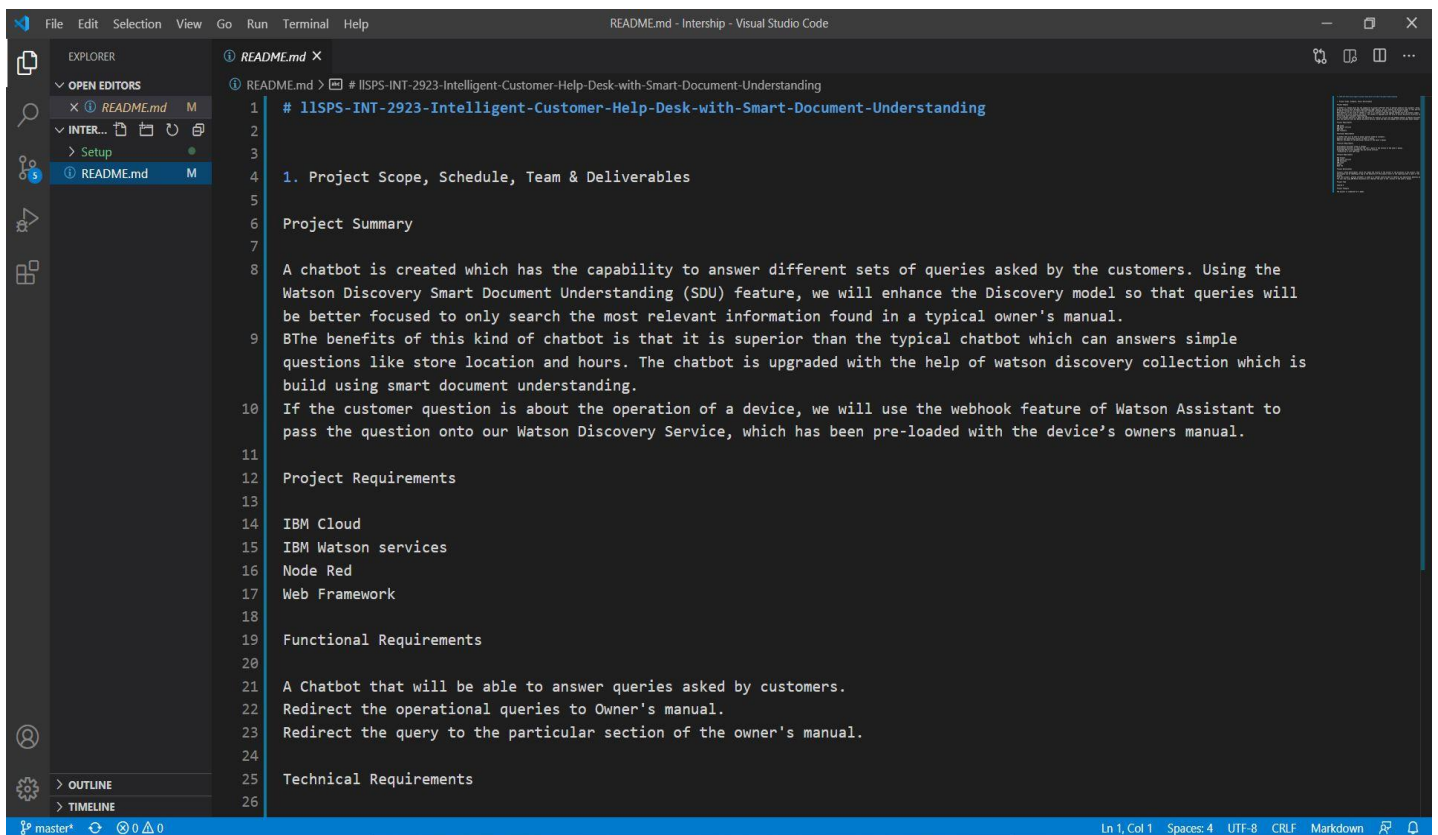
Not something down



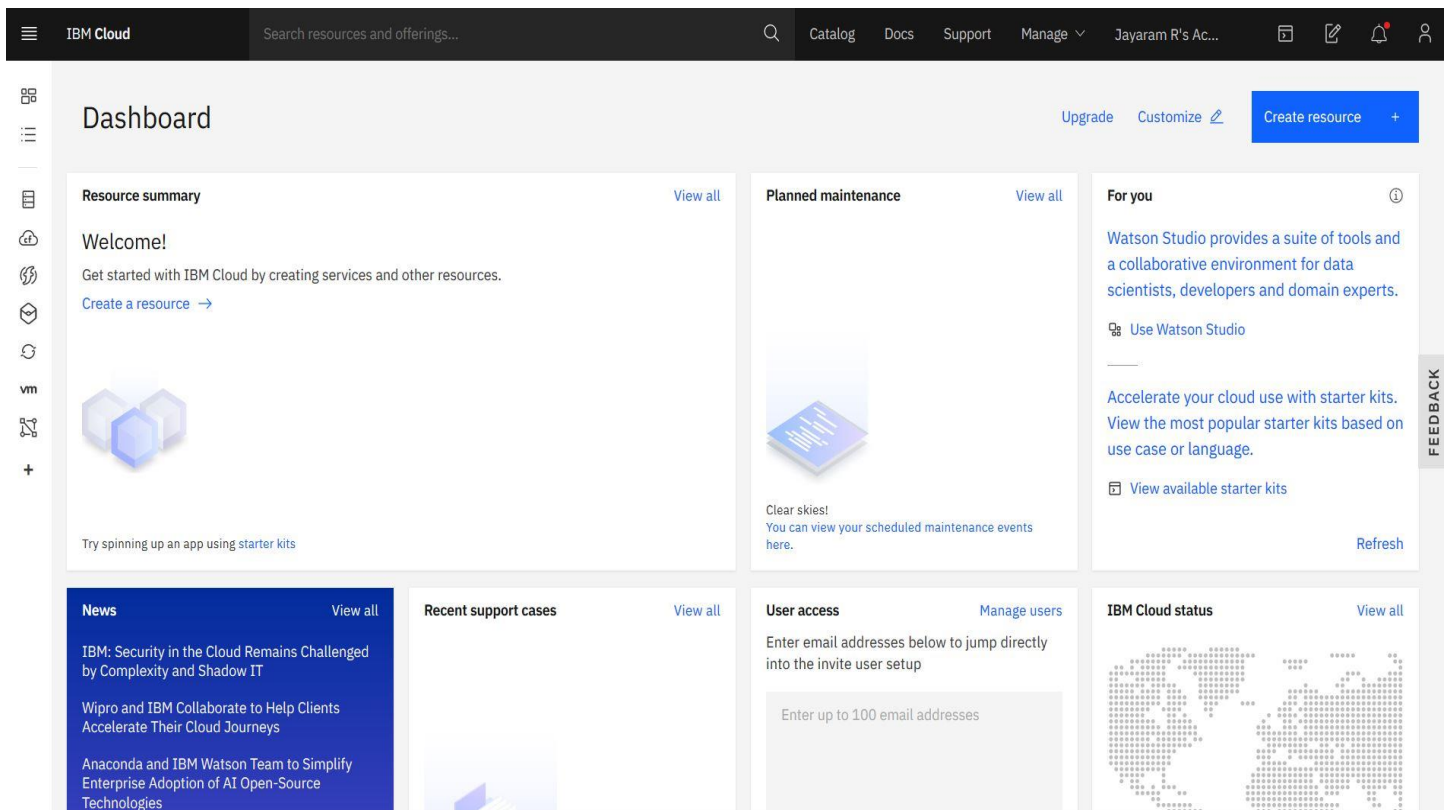
## Zoho Writer



## IDE - Visual Studio Code

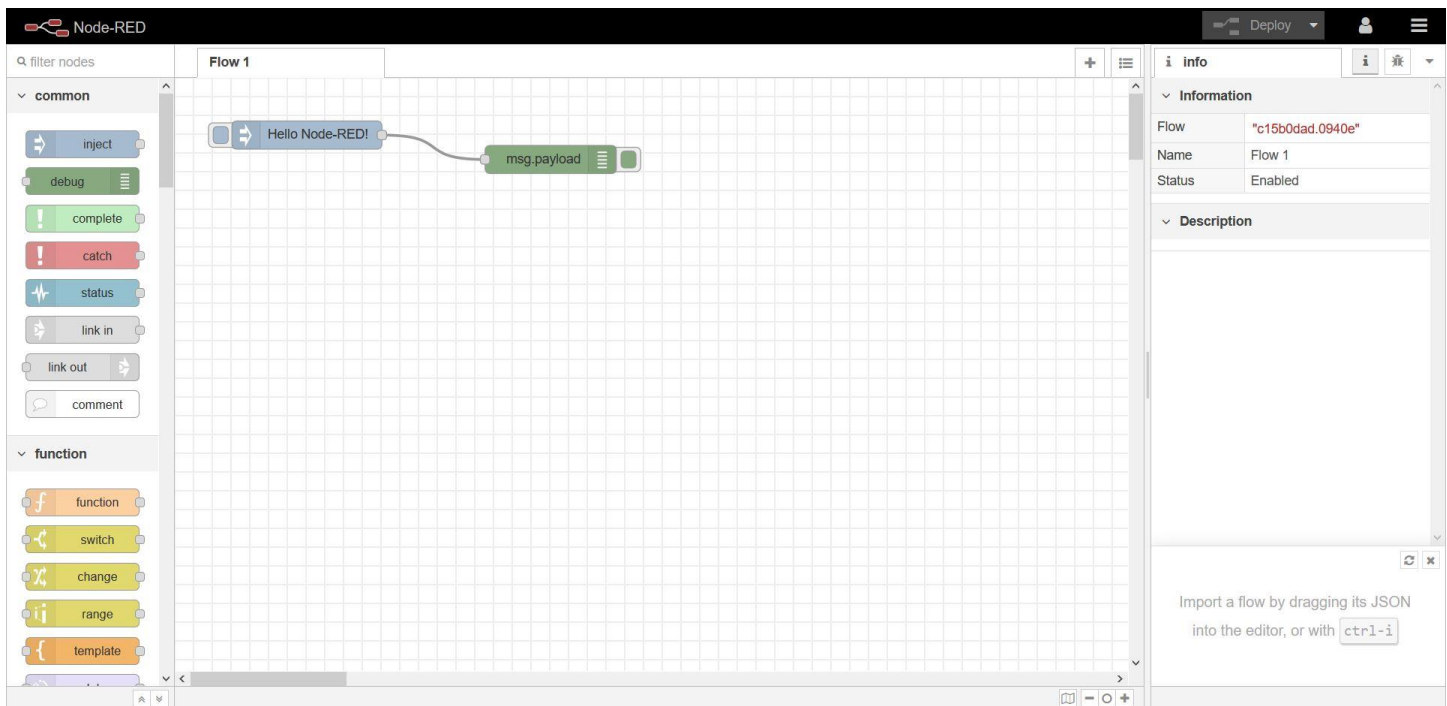


## 3. Create IBM Cloud Account



## 4. Create a Node-RED Starter Application

### Node-RED Starter Application



### Create A Simple Webpage

Flow 1

My simple webpage

[get] /simple

Simple Web Page

http

Tick every 5 secs

format time nicely

[ws] /ws/simple

disconnected

[ws] /ws/simple

disconnected

msg.payload

My Website

A website created by me.

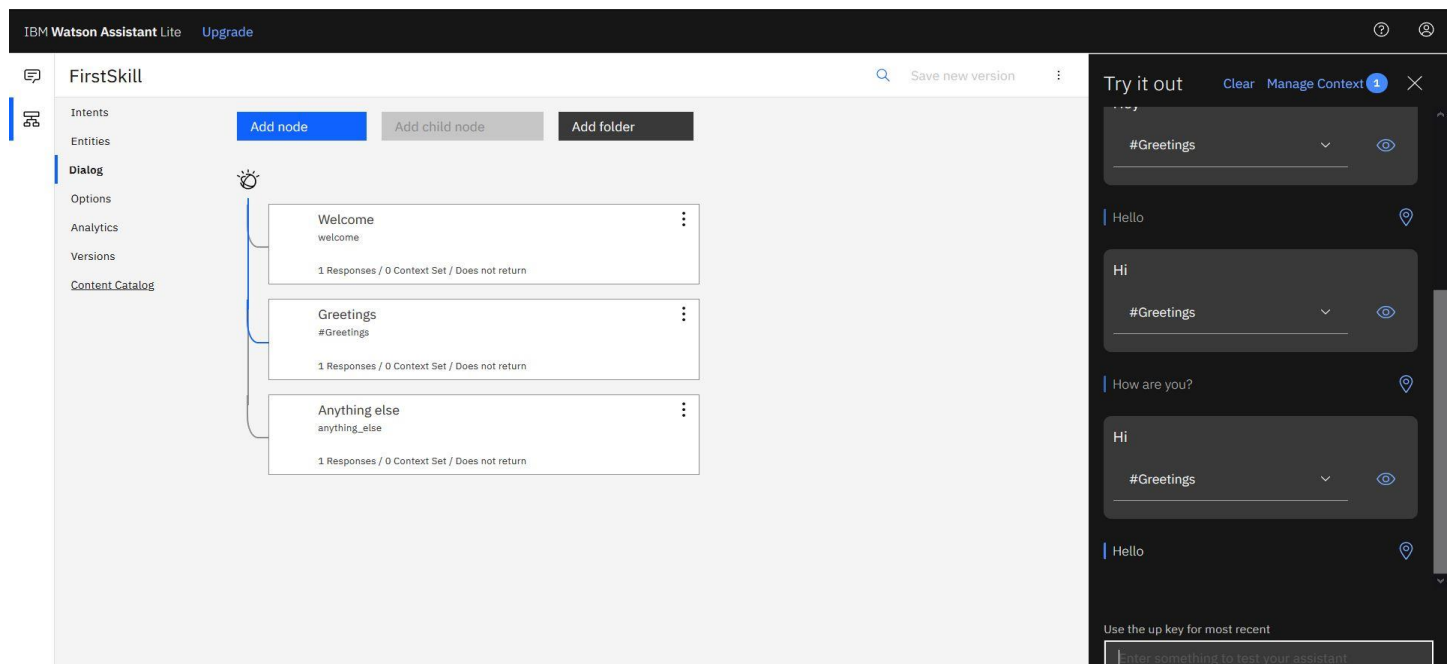
Link Link Link Link

Webpage Link : <https://node-red-dwzus.eu-gb.mybluemix.net/simple>

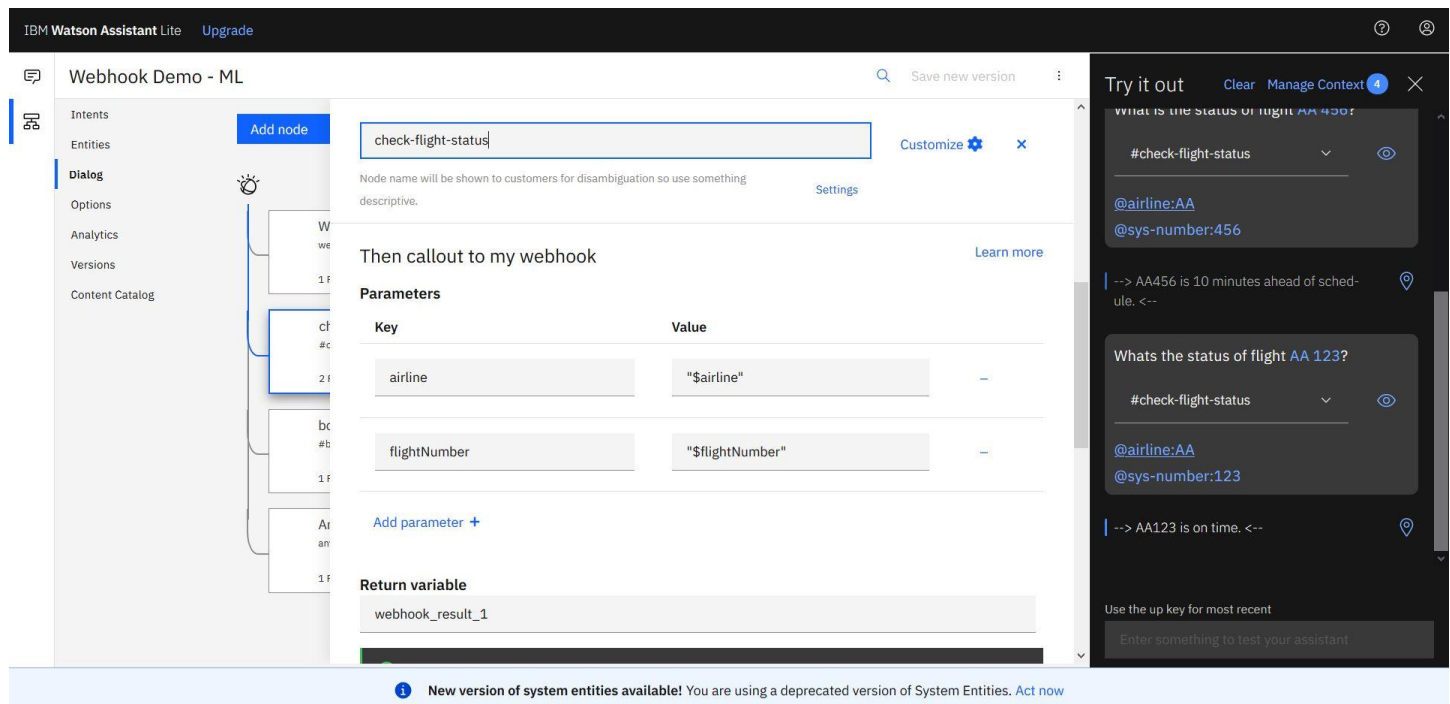
## 5. Introduction to Watson Assistance



# Build Your Own AI Assistant (Chabot) with IBM Watson Assistant



## IBM Cloud: How to Use Watson Assistant with Webhooks



## 6. Introduction to Watson Discovery

### Extract Answers from Large Document in 5 Minutes

Identify fields   Manage fields   Enrich fields

ecobee3\_UserGuide.pdf

1/1

39 / 41



## Field labels

Identify document elements using the labels below.

+ Create new   Upgrade

- answer
- author
- footer
- header
- question
- subtitle
- table\_of\_contents
- text
- title
- image   Upgrade
- table

[Learn more about how to use.](#)

IBM Watson Discovery

Instance: Watson Discovery Lite - 1592...



owners-manual / 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](#)

how do i turn on heater?

+ Include analysis of your results

+ Filter which documents you query

&gt; More options

Run query

Close

Summary   JSON

[Train Watson to improve results](#)Query URL <https://api.eu-gb.discovery.watson.cloud.ibm.com/instances/0/>

## Passages

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

"This menu lets you test the wiring and connections of the devices connected to the thermostat by turning them on or off. The equipment will turn off when you exit the menu. Warning: Compressor protection and minimum run-time features are not enforced while in this mode."

"Boiler or Radiant System with Air Handler and Conventional Cooling or Heat Pump Do not jumper Rc or Rh, ecobee3 does this automatically. R can go into either Rc or Rh terminals on your ecobee3. Do not jumper Rc or Rh, ecobee3 does this automatically."

"Do not jumper Rc or Rh, ecobee3 does this automatically. R can go into either Rc or Rh terminals on your ecobee3. Heat Do not jumper Rc or Rh, ecobee3 does this automatically. R can go into either Rc or Rh terminals on your ecobee3."

"You can also configure the screen to automatically sleep (i.e. turn off) whenever your ecobee3 enters the Sleep activity period. For example, if your thermostat is located in a bedroom, you may want to blank the screen when you are sleeping, whereas if the thermostat is in a hallway, you may want the screen displayed all the time."

## 7. Getting Started with IBM Cloud Functions

### Getting Hands-on with IBM Cloud Functions



IBM Cloud

Search resources and offerings...

Catalog Docs Support Manage Jayaram R's Ac...

Functions / Actions / video-hello

video-hello

Web Action

Namespace: jayaramr@ieee.org\_dev(London)

Code

Parameters Runtime Endpoints

Connected Triggers Enclosing Sequences Logs

Code Node.js 10

Invoke with parameters Invoke

```

1 /**
2  *
3  * main() will be run when you invoke this action
4  *
5  * @param Cloud Functions actions accept a single parameter, which must be a JSON object.
6  *
7  * @return The output of this action, which must be a JSON object.
8  *
9  */
10 function main(params) {
11   return { message: 'Hello World Video' };
12 }
13

```

Activations Collapse Clear

video-hello 36 ms 6/17/2020, 19:29:06

Activation ID: f659159e87e640c499159e87e650c4c5

Results: { "message": "Hello World Video" }

Logs: []

Functions

Getting Started

Actions

Triggers

APIs

Monitor

Logs

Namespace Settings

Current Namespace: jayaramr@ieee.org\_dev (London)(CF-B...

Monitor

Filtering Options

Time Frame most recent 50

Limit to All Actions

Exclude triggers from the views?

Activity Summary

minute-trigger 25 activations

video-hello 25 activations 2.28 ms

Activity Log

video-hello 6/17/2020, 8:25:01 PM | 2 ms

minute-trigger 6/17/2020, 8:25:01 PM

video-hello 6/17/2020, 8:24:00 PM | 2 ms

Activity Timeline

Invocation count over time

8:01:00 PM

8:13:01 PM

8:25:01 PM

JSON Raw Data Headers

Save Copy Collapse All Expand All Filter JSON

message: "Hello Jayaram from India"

## 8. Create necessary IBM Cloud Services

IBM Cloud

Search resources and offerings...

Catalog Docs Support Manage Jayaram R's Ac...

Resource list

Create resource +

Name	Group	Location	Offering	Status	Tags
Filter by name or IP address... Filter by group or org... Filter... Filter... Filter... Filter...					
Devices (0)					
VPC infrastructure (0)					
Clusters (0)					
Cloud Foundry apps (1)					
Node RED DWZUS	jayaramr@ieee.org / dev	London	SDK for Node.js™	Started	—
Cloud Foundry services (1)					
node-red-dwzus-cloudant-1592232412...	jayaramr@ieee.org / dev	London	Cloudant	Provisioned	—
Services (4)					
Continuous Delivery	Default	London	Continuous Delivery	Active	—
Watson Assistant-61	Default	London	Watson Assistant	Active	—
Watson Discovery Lite - 1592380243269	Default	London	Discovery	Active	—
node-red-dwzus-cloudant-1592232412...	Default	Dallas	Cloudant	Active	—
Storage (0)					

IBM Cloud

Search resources and offerings...

Catalog Docs Support Manage Jayaram R's Ac...

Resource list

Create resource +

Name	Group	Location	Offering	Status	Tags
Filter by name or IP address... Filter by group or org... Filter... Filter... Filter... Filter...					
Services (4)					
Watson Discovery Lite - 1592380243269	Default	London	Discovery	Active	—
node-red-dwzus-cloudant-1592232412...	Default	Dallas	Cloudant	Active	—
Storage (0)					
Network (0)					
Cloud Foundry enterprise environments (0)					
Functions namespaces (0)					
Apps (1)					
Node RED DWZUS	Default	Global	Cloud Application	—	—
Developer tools (1)					
NodeREDDWZUS	Default	London	Toolchain	—	—
VMware (0)					
Schematics workspaces (0)					

## 9. Configure Watson Discovery Service

IBM Watson Discovery

Instance: Watson Discovery Lite - 1592...

Manage data

Collections of your private data and pre-enriched data to configure and query against. [Learn more.](#)

Create a new data collection

Create COVID-19 Kit

Upload your own data

Connect a data source

PRE-ENRICHED DATA

Watson Discovery News

News sources: English

PRIVATE DATA

Owners-Manual-Tesla

Indexed on 6/18/2020

IBM Watson Discovery

Instance: Watson Discovery Lite - 1592

Owners-Manual-Tesla

Configure data

OverviewErrors and warnings (281)Search settings

281 documents

0 documents failed  
View details

Created on 6/18/2020 12:49:18 pm EDT  
Last updated 6/18/2020 12:49:18 pm EDT

Upload documents

Identified 6 fields from your data

footer

header

subtitle

table\_of\_contents

text

title

Need to identify more fields? Add fields

Added 4 enrichments to your data

Entity Extraction

Tesla (36) | Autosteer (12) | Autopark (6) | \$100,000 (5) | 150 km/h (5)

Concept Tagging

Automobile (42) | English-language films (18) | Cruise control (16)

5 enrichments available. Add enrichments

Now you're ready to query!

Top people related to /automotive and vehicles/cars/sedan

Run

Top entities with their average, min, max sentiment score

Run

Entities of type Quantity which have negative sentiment

Run

IBM Watson Discovery

Instance: Watson Discovery Lite - 1592

Manage dataView data schemaBuild queriesView data metrics

Owners-Manual / Build queries

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

Use a sample query

Search for documents

Use natural languageUse the Discovery Query Language

how to turn on heater?

+ Include analysis of your results

+ Filter which documents you query

> More options

Run queryClose

SummaryJSON

Train Watson to improve results

ecobee3\_UserGuide.pdf

Sentiment positive

Concepts Heater

Text "...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...."

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

> ecobee3\_UserGuide.pdf

IBM Watson Discovery

Instance: Watson Discovery Lite - 1592

Owners-Manual-Tesla / Build queries

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

Use a sample query

Search for documents

Use natural languageUse the Discovery Query Language

How to start valet mode

+ Include analysis of your results

+ Filter which documents you query

> More options

Run queryClose

SummaryJSON

Train Watson to improve results

Passages

"The first time you enter Valet mode, you will be prompted to create a 4-digit PIN that you will use to cancel Valet mode. When Valet mode is active, the instrument panel displays the word Valet above the driving speed and the Valet mode driver profile displays on the touchscreen. You can also use the mobile app to start and cancel Valet mode (provided Model S is in Park)."

"You can also use the mobile app to start and cancel Valet mode (provided Model S is in Park). When using the mobile app, you do not need to enter a PIN because you are already required to log into the app using your Tesla Account credentials."

"It also locks when Model S is in Valet mode (see Valet Mode on page 38). It does not lock when you lock Model S using the lock icon on the touchscreen's status bar."

"NOTE: The front trunk locks whenever closed and you lock Model S using either the touchscreen or externally using the key or mobile app, you leave Model S carrying your key (if Walk-Away Locking on page 12 is turned on), or when Valet mode is active (see Valet Mode on page 38)."

"With Model S in Park, touch the driver profile icon on the top of the touchscreen, then touch Valet Mode. The first time you enter Valet mode, you will be prompted to create a 4-digit PIN that you will use to cancel Valet mode."

Results

## 10. Create Cloud Functions Action

IBM Cloud

Search resources and offerings...

Catalog Docs Support Manage Jayaram R's Ac...

Current Namespace: jayaramr@ieee.org\_dev (London)(CF-B...

Actions

Search Actions

Create

Default Package

Name	Runtime	Web Action	Memory	Timeout
disco-action	Node.js 10	Enabled	256 MB	60 s

Items per page: 10

1-1 of 1 items

1 of 1 pages

Functions / Actions / disco-action

disco-action

Web Action

Namespace: jayaramr@ieee.org\_dev(London)

Code

Parameters

Runtime

Endpoints

Connected Triggers

Enclosing Sequences

Logs

Code Node.js 10

Invoke with parameters

Invoke

```

1 // **
2 *
3 * @param {object} params
4 * @param {string} params.iam_apikey
5 * @param {string} params.url
6 * @param {string} params.username
7 * @param {string} params.password
8 * @param {string} params.environment_id
9 * @param {string} params.collection_id
10 * @param {string} params.configuration_id
11 * @param {string} params.input
12 *
13 * @return {object}
14 *
15 */
16
17 const assert = require('assert');
18 const DiscoveryV1 = require('watson-developer-cloud/discovery/v1');
19
20 // **
21 *
22 * main() will be run when you invoke this action
23 *
24 * @param Cloud Functions actions accept a single parameter, which must be a JSON object.
25 *
26 * @return The output of this action, which must be a JSON object.
27 *
28 */
29 * function main(params) {
30 *   return new Promise(function (resolve, reject) {
31 *     let discovery;
32 *
33 *     if (params.iam_apikey){

```

Activations

Collapse

Clear

disco-action 1080 ms 6/18/2020, 19:04:33

Activation ID: 2ab6790ed187479cb6790ed187579ca2

Results:

```

{
  "matching_results": 128,
  "passages": [
    {
      "enriched_text": {
        "categories": [
          {
            "label": "/technology and computing/hardware/computer components",
            "score": 0.793359
          },
          {
            "label": "/technology and computing/hardware/computer peripherals",
            "score": 0.775517
          },
          {
            "label": "/technology and computing/hardware/computer/portable computer",
            "score": 0.74596
          }
        ]
      }
    }
  ]
}

```

# 11. Configure Watson Assistant

IBM Watson Assistant Plus trial 29 days left Upgrade

Assistants

An assistant helps your customers complete tasks and get information faster. It may clarify requests, search for answers from a knowledge base, and can also direct your customer to a human if needed.



Create assistant

ChatBOT

Skills (2)

Customer Care Sample Skill, Doc-Understanding

Integrations (1)



## Skills

Skills contain the training to respond to your customer queries. Add skills to your assistant and then deploy to your channels.

Create skill

### Customer Care Sample Skill

TYPE: Dialog — English (US)

CREATED: Jun 18, 2020 4:25 PM IST      UPDATED: Jun 19, 2020 1:46 PM IST



LINKED ASSISTANTS (1): ChatBOT

### Doc-Understanding-Tesla

TYPE: Search Plus

CREATED: Jun 19, 2020 8:47 AM IST

LINKED ASSISTANTS (1): ChatBOT



## Customer Care Sample Skill Version: Development

Save new version Try it

Intents

Entities

Dialog

Options



Analytics

Versions

Content Catalog

Intents (10) ↑

	Description	Modified T↓	Conflicts T↓	Examples T↓
<input type="checkbox"/> #Cancel	Cancel the current request	2 hours ago		7
<input type="checkbox"/> #Customer_Care_Appointments	Schedule or manage an in-store appointment.	2 hours ago		20
<input type="checkbox"/> #Customer_Care_Store_Hours	Find business hours.	2 hours ago		48
<input type="checkbox"/> #Customer_Care_Store_Location	Locate a physical store location or an address.	2 hours ago		25
<input type="checkbox"/> #General_Connect_to_Agent	Request a human agent.	2 hours ago		47
<input type="checkbox"/> #General_Greetings	Greetings	2 hours ago		30
<input type="checkbox"/> #Goodbye	Good byes	2 hours ago		6
<input type="checkbox"/> #Help	Ask for help	2 hours ago		8
<input type="checkbox"/> #Product_Information	User wants help using the thermostat	2 hours ago		3



## Customer Care Sample Skill Version: Development

Save new version

Intents

Entities

Dialog

Options

Analytics

Versions

Content Catalog

Add node Add child node Add folder

1 Responses / 0 Context Set / Does not return

#Thanks

1 Responses / 0 Context Set / Does not return

Please transfer me to an agent

#General\_Connect\_to\_Agent

1 Responses / 0 Context Set / Does not return

What can I do

#Help

1 Responses / 0 Context Set / Does not return

Ask about product

#Product\_Information

2 Responses / 0 Context Set / Does not return

anything\_else

1 Responses / 0 Context Set / Returns

Try it out Clear Manage Context 1 X

Hello, I'm a demo customer care virtual assistant to show you the basics. I can help with directions to my store, hours of operation and booking an in-store appointment

What is the pricing?

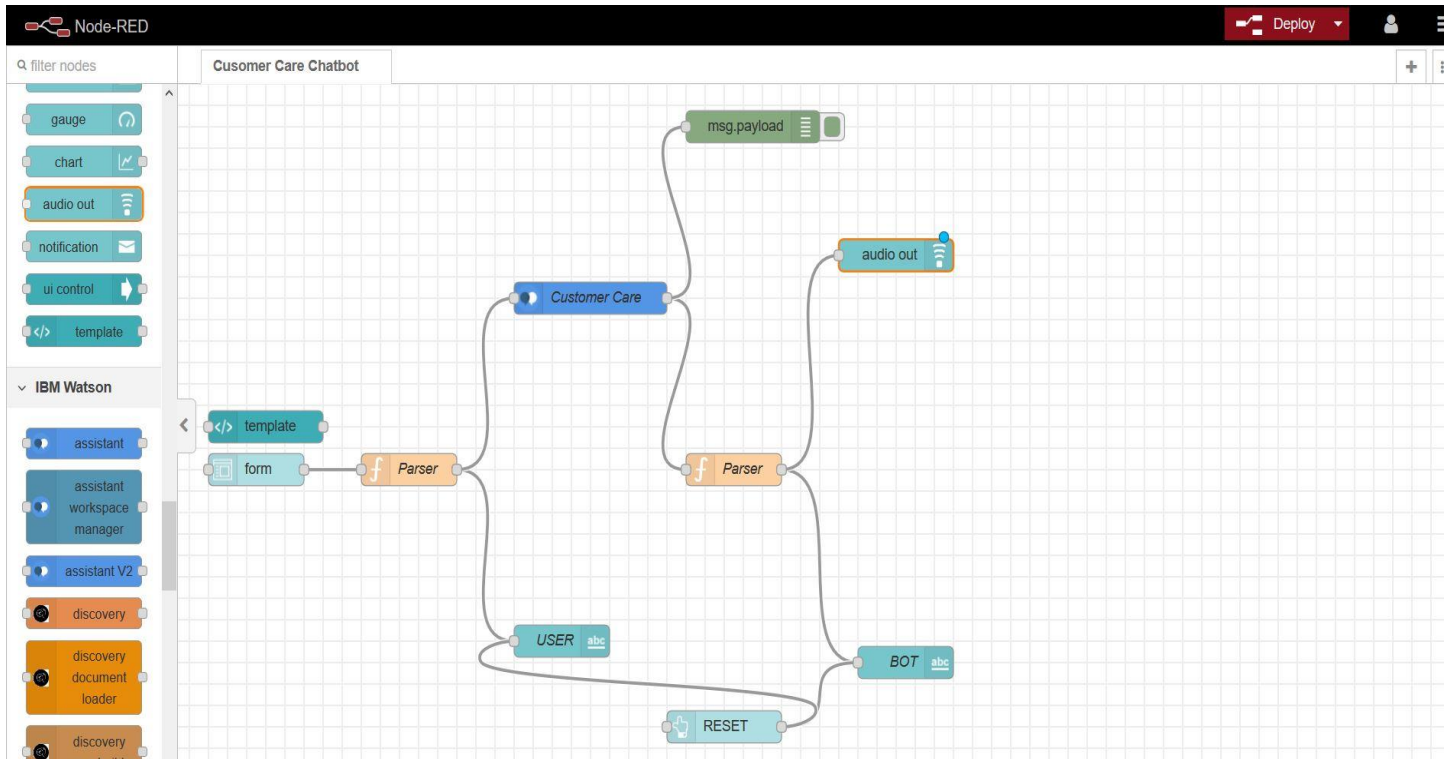
#Product\_Information

"The Model S is priced to maximize profit and demand by utilizing a value pricing strategy. The Model S with a current base ticket price of \$65,400, allows the Model S to compete with both the hybrid market and the luxury market."

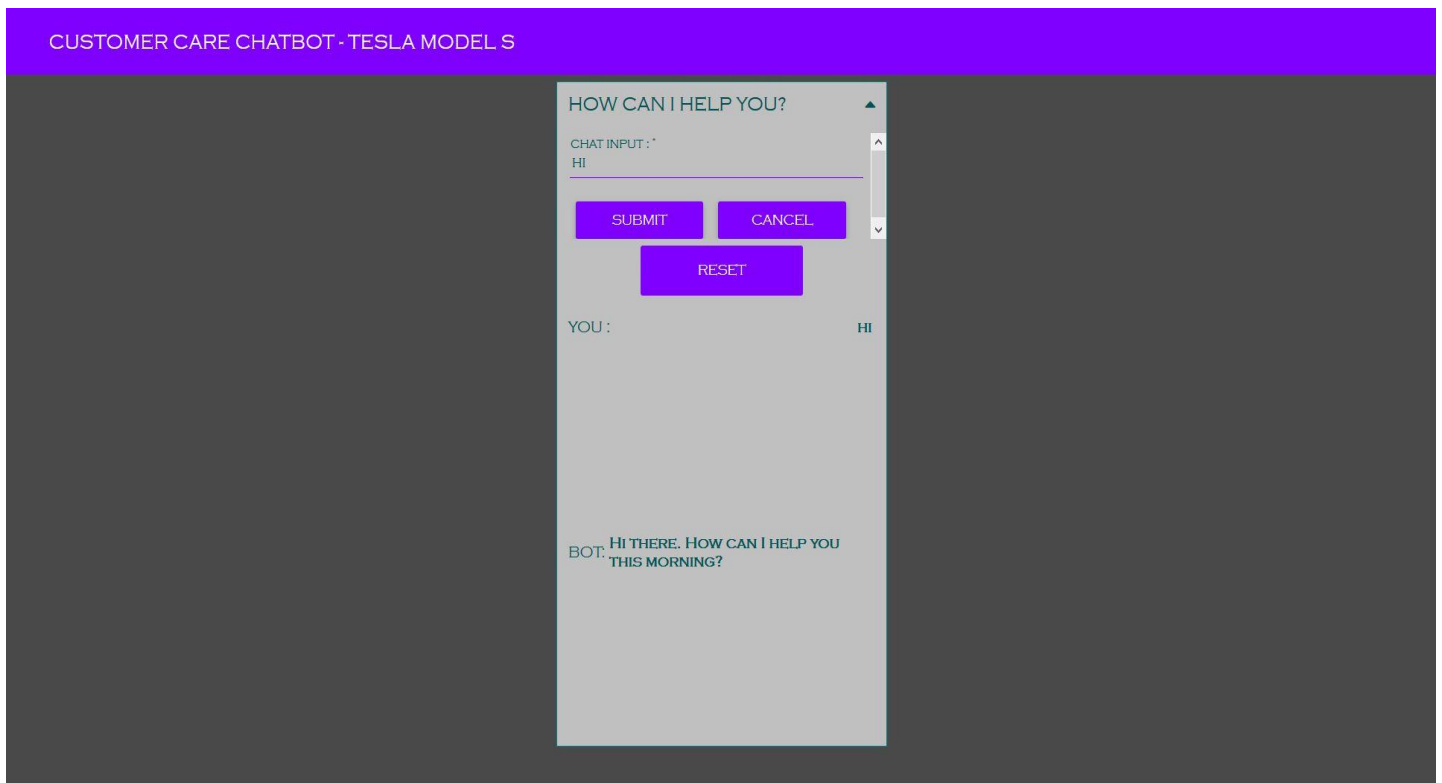
Use the up key for most recent

Enter something to test your assistant

## 12. Build Node-RED Flow to Integrate All Services

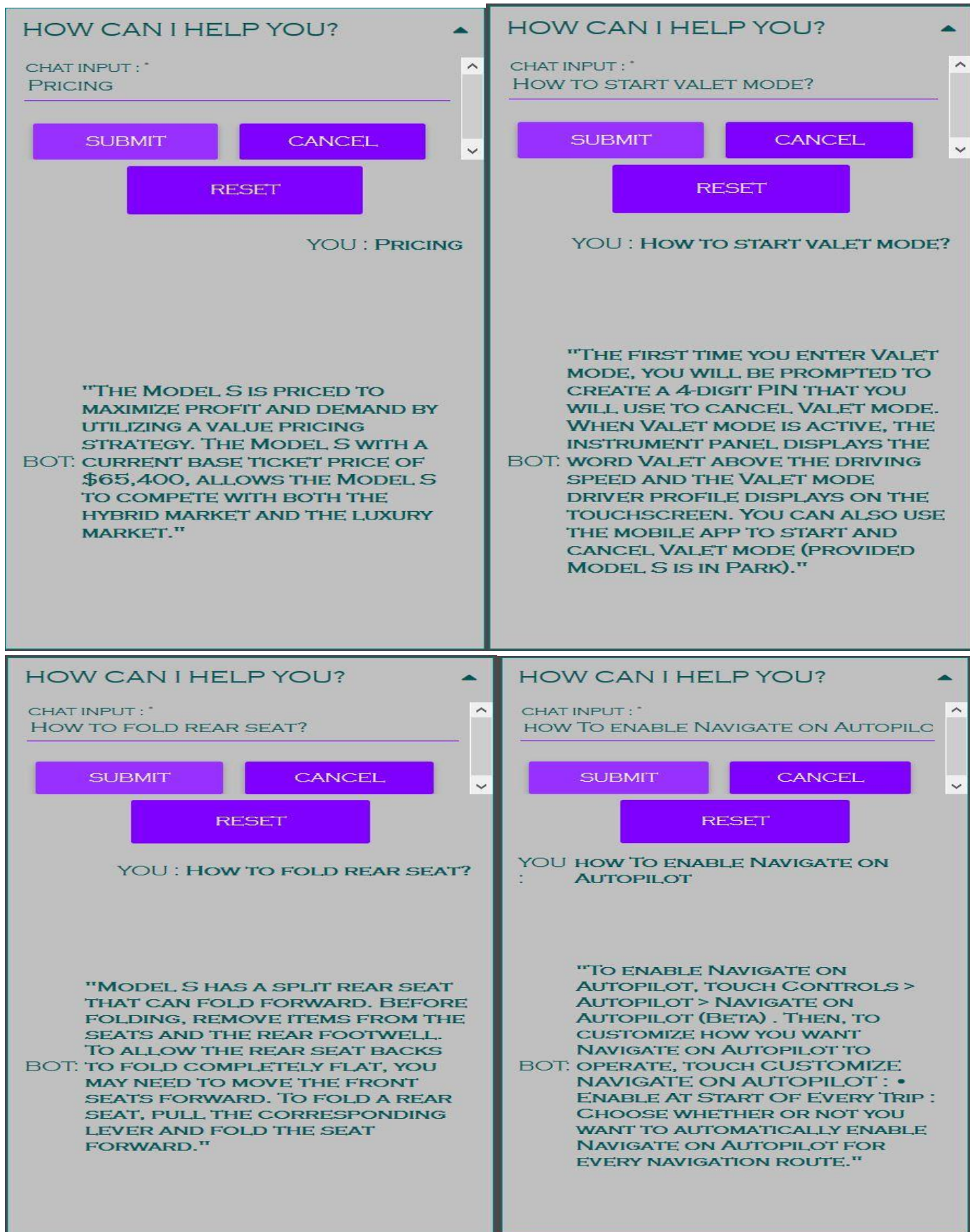


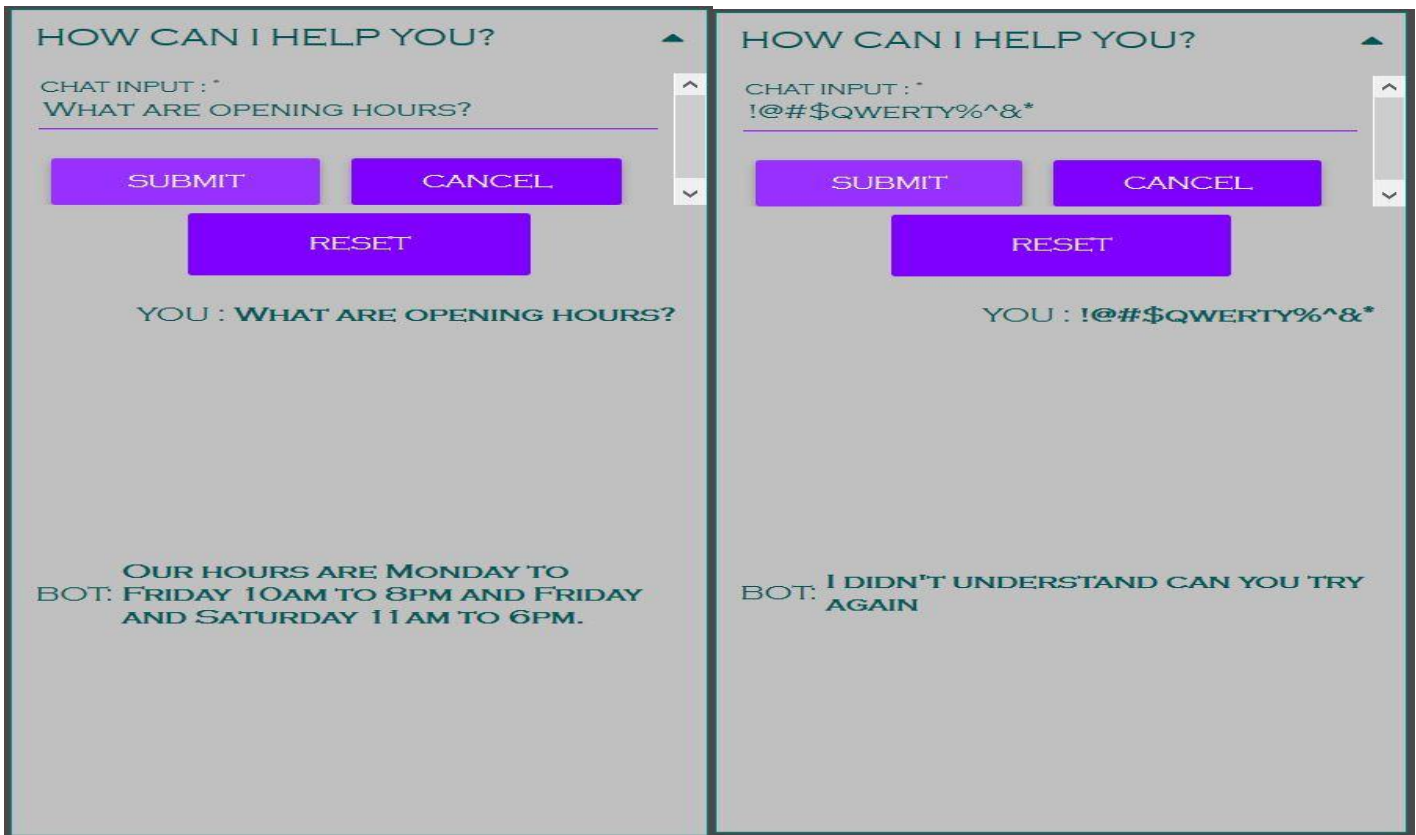
## 13. Build a Web Dashboard



## 14. Test the Bot & Capture the Results







## 15. Prepare the Project Report & Upload the Node-RED Flow to GitHub

GitHub repository page for **SmartPracticeschool / IISPS-INT-2923-Intelligent-Customer-Help-Desk-with-Smart-Documen-Understanding**.

Repository statistics: 10 commits, 1 branch, 0 packages, 0 releases, 1 contributor.

Branch: master | New pull request | Create new file | Upload files | Find file | Clone or download

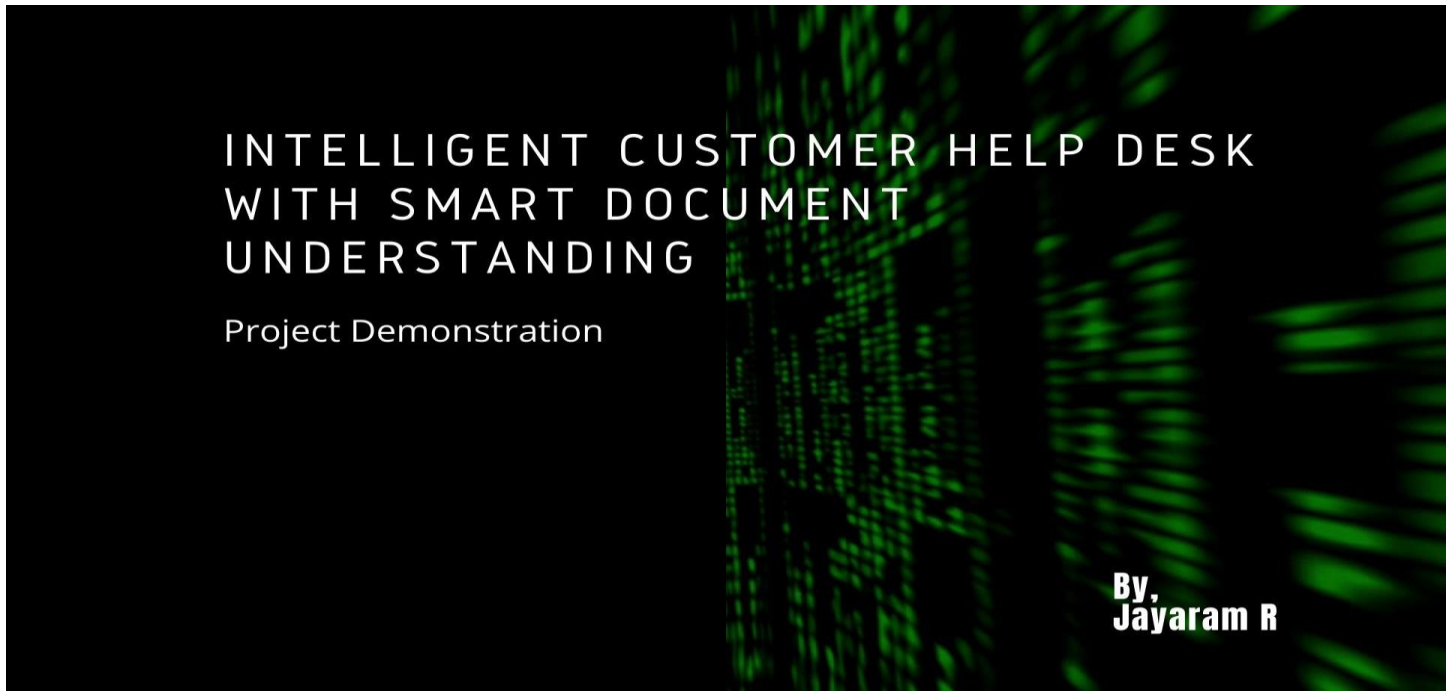
Latest commit 26a4491 32 seconds ago by JayaramR307: Update README.md

File	Commit Message	Time Ago
Cloud-Function.js	Added Cloud function js file	29 minutes ago
Node-RED-flows.json	Added Node-RED flow json file	36 minutes ago
README.md	Update README.md	32 seconds ago
model_s_owners_manual_europe_en_eu...	Added product manual for smart document understanding	19 minutes ago
skill-Customer-Care-Sample-Skill.json	Added Skill json file	26 minutes ago

README.md

IISPS INT 2023 Intelligent Customer Help Desk with Smart

## 16. Create a Project Demo Video & Upload to Youtube



Video Link: <https://www.youtube.com/watch?v=w5GH-pFoNoc>

### Conclusion

A customer care Chabot with smart document understanding is implemented.

**End**