

# Intelligent Customer Help Desk with Smart Document Understanding

**Kickoff Date :** 01-MAY-2020

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**Project Sponsor :** THESMARTBRIDGE ([Smart Internz RSIP 2020](#))

Internship Title	:	Intelligent Customer Help Desk with Smart Document Understanding - SB6832
Project ID	:	SPS_PRO_99

- **Project Summary :** This is a smart chatbot service which can answer customer queries and can search the product manual and differentiate important and not important points for reference, without human aid, completely developed using Artificial Intelligence and IoT.
- **Project Requirements :** Python, IBM Cloud, IBM Watson
- **Project Delivery :** 24-MAY-2020

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# **1. INTRODUCTION**

## **1.1 OVERVIEW:**

Presently the customer care service are heavily dependent on manual labour. The automated call does not help to much extent. Being the era of Artificial Intelligence, Internet of Things and Cloud, we present the need of the hour, A SmartBot made and deployed using these edge cutting technologies.

## **1.2 PURPOSE:**

- 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:**

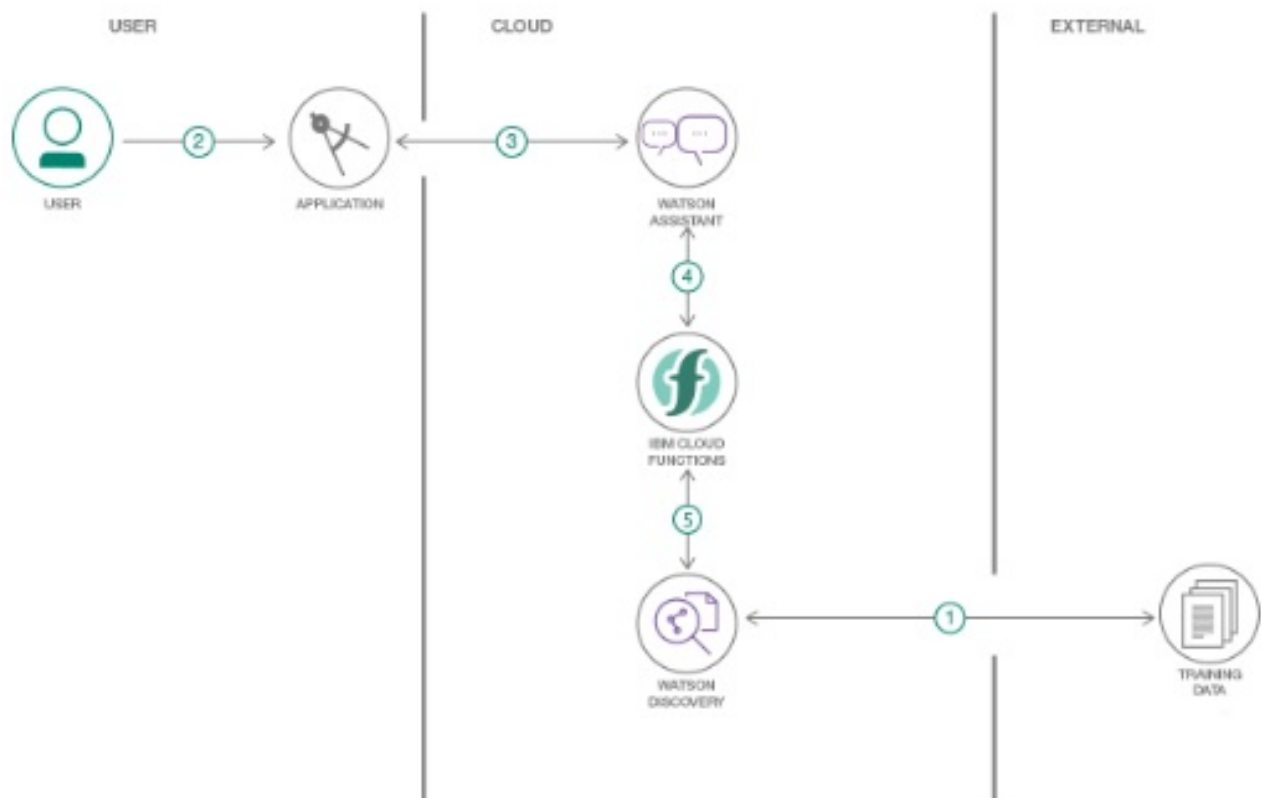
- © *The typical customer care chatbot can answer simple questions, such as store locations and hours, directions, and maybe even making appointments. When a question falls outside of the scope of the pre-determined question set, the option is typically to tell the customer the question isn't valid or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

### **2.2 Proposed Solution:**

- © *In this project, there will be another option. If the customer question is about the operation of a device, the application shall pass the question onto Watson Discovery Service, which has been pre-loaded with the device's owners manual. So now, instead of "Would you like to speak to a customer representative?" we can return relevant sections of the owners manual to help solve our customers' problems.*
- © *To take it a step further, the project shall use the Smart Document Understanding feature of Watson Discovery to train it on what text in the owners manual is important and what is not. This will improve the answers returned from the queries.*

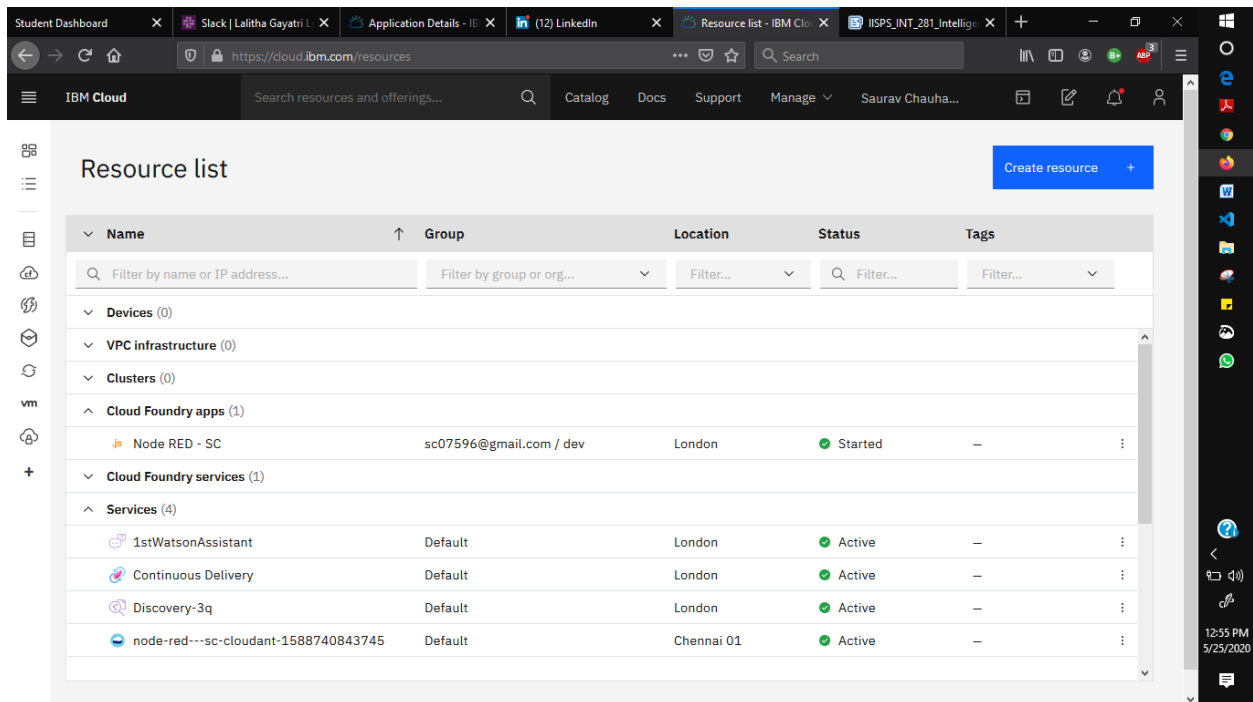
### 3. THEORETICAL ANALYSIS

#### *BLOCK DIAGRAM*



## 4. EXPERIMENTAL INVESTIGATIONS

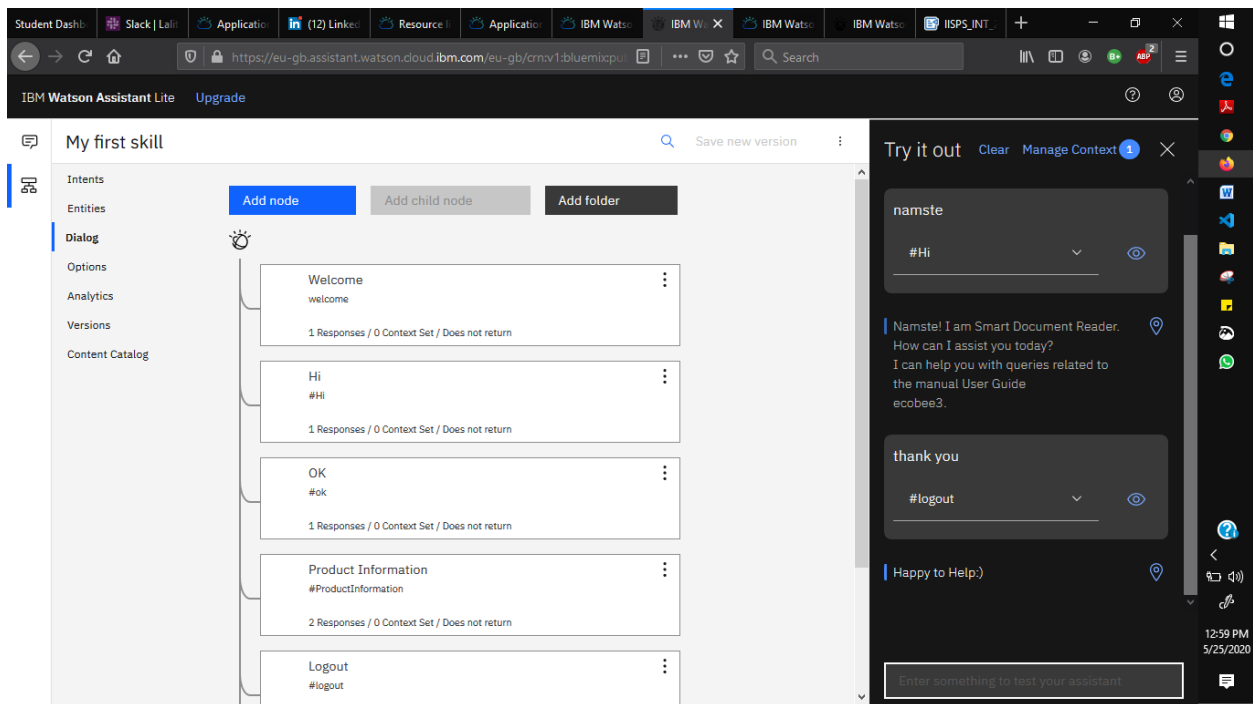
### >Resource List



The screenshot shows the IBM Cloud Resource list page. The browser tabs include Student Dashboard, Slack | Lalitha Gayatri, Application Details, (12) LinkedIn, Resource list - IBM Cloud, and IISPS\_INT\_281\_Intelligence. The URL is https://cloud.ibm.com/resources. The page header includes the IBM Cloud logo, a search bar, and navigation links for Catalog, Docs, Support, and Manage. A sidebar on the left contains icons for various resources. The main content area is titled "Resource list" and features a "Create resource" button. Below the title is a table with columns: Name, Group, Location, Status, and Tags. The table lists several resources, including Cloud Foundry apps and services.

Name	Group	Location	Status	Tags
Filter by name or IP address... Filter by group or org... Filter... Filter... Filter...				
Devices (0)				
VPC infrastructure (0)				
Clusters (0)				
Cloud Foundry apps (1)				
Node RED - SC	sc07596@gmail.com / dev	London	Started	—
Cloud Foundry services (1)				
Services (4)				
1stWatsonAssistant	Default	London	Active	—
Continuous Delivery	Default	London	Active	—
Discovery-3q	Default	London	Active	—
node-red---sc-cloudant-1588740843745	Default	Chennai 01	Active	—

### >Watson Assistant



The screenshot shows the IBM Watson Assistant Lite interface. The browser tabs include Student Dashb..., Slack | Lali..., Application..., (12) Link..., Resource l..., Application..., IBM Wats..., IBM W..., IBM Wats..., IBM Wats..., and IISPS\_INT\_... The URL is https://eu-gb.assistant.watson.cloud.ibm.com/eu-gb/crmv1.1/bluemixpu... The page header includes the IBM Watson Assistant Lite logo and an "Upgrade" button. The main content area is titled "My first skill" and features a "Save new version" button. On the left is a sidebar with navigation links for Intents, Entities, Dialog, Options, Analytics, Versions, and Content Catalog. The main area shows a dialog flow with nodes for Welcome, Hi, OK, Product Information, and Logout. On the right is a "Try it out" panel with a chat interface showing a conversation with the assistant.

My first skill Save new version

Intents Entities Dialog Options Analytics Versions Content Catalog

Add node Add child node Add folder

Welcome  
welcome  
1 Responses / 0 Context Set / Does not return

Hi  
#Hi  
1 Responses / 0 Context Set / Does not return

OK  
#ok  
1 Responses / 0 Context Set / Does not return

Product Information  
#ProductInformation  
2 Responses / 0 Context Set / Does not return

Logout  
#logout

Try it out Clear Manage Context

namste  
#Hi

Namste! I am Smart Document Reader.  
How can I assist you today?  
I can help you with queries related to  
the manual User Guide  
ecobee3.

thank you  
#logout

Happy to Help!)

Enter something to test your assistant

## >Watson Discovery

The screenshot shows the IBM Watson Discovery web application. The top navigation bar includes tabs for 'Student Dash...', 'Slack | L...', 'Applicati...', '(12) Link...', 'Resource', 'Applicati...', 'IBM Wats...', 'IBM Wats...', 'IBM Wats...', 'IBM Wats...', 'ISPS\_INT...', and 'ISPS\_INT...'. The main header displays 'IBM Watson Discovery' and 'Instance: Discovery-3q'. The left sidebar contains a folder icon, a document icon, a magnifying glass, and a list icon. The main content area is titled 'ecobee3 manual / Configure data' and includes a 'Apply changes to collection' button. Below this, there are tabs for 'Identify fields', 'Manage fields', and 'Enrich fields'. The 'Identify fields' tab is active, showing a document preview of 'ecobee3\_UserGuide.pdf' with a sidebar of document thumbnails (12, 13, 14, 15) and a 'Field labels' panel on the right. The 'Field labels' panel includes a 'Create new' button and a list of labels: 'answer', 'author', 'footer', 'header', 'question', 'subtitle', 'table\_of\_contents', 'text', 'title', 'image', and 'table'. The document preview shows a page with a green checkmark and a list of sections: 'On the left', 'On the right', 'On the top', 'On the bottom', 'On the left and right', 'On the top and bottom', 'On the left and bottom', 'On the right and bottom', 'On the top and right', 'On the bottom and right', 'On the top and left', 'On the bottom and left', 'On the top and right and bottom', 'On the bottom and right and top', 'On the top and left and right', 'On the bottom and left and right', 'On the top and right and bottom and left', 'On the bottom and right and top and left', 'On the top and left and right and bottom', 'On the bottom and left and right and top'.

## >Node Red Editor

The screenshot shows the Node-RED web application. The top navigation bar includes tabs for 'Student Dash...', 'Slack | L...', 'Applicati...', '(12) Link...', 'Resource', 'Applicati...', 'Node-RED', 'IBM Wats...', 'IBM Wats...', 'IBM Wats...', 'IBM Wats...', 'ISPS\_INT...', and 'ISPS\_INT...'. The main header displays 'Node-RED' and 'Deploy'. The left sidebar contains a 'filter nodes' search bar and a list of nodes categorized under 'common' and 'function'. The main content area shows a flow diagram titled 'Smart Bot' with nodes: 'form', 'function', 'assistant', 'YOU', 'msg payload', and 'SMART BOT'. The right sidebar contains an 'info' panel with 'Information' and 'Description' tabs, and a 'debug' panel. The 'Information' panel shows the flow ID 'd4e411a5.b0aeb', the name 'Smart Bot', and the status 'Enabled'. The 'Description' panel is empty. The 'debug' panel shows a message: 'Enable or disable these tips from the option in the settings'.

## >Final project

### Example 1:

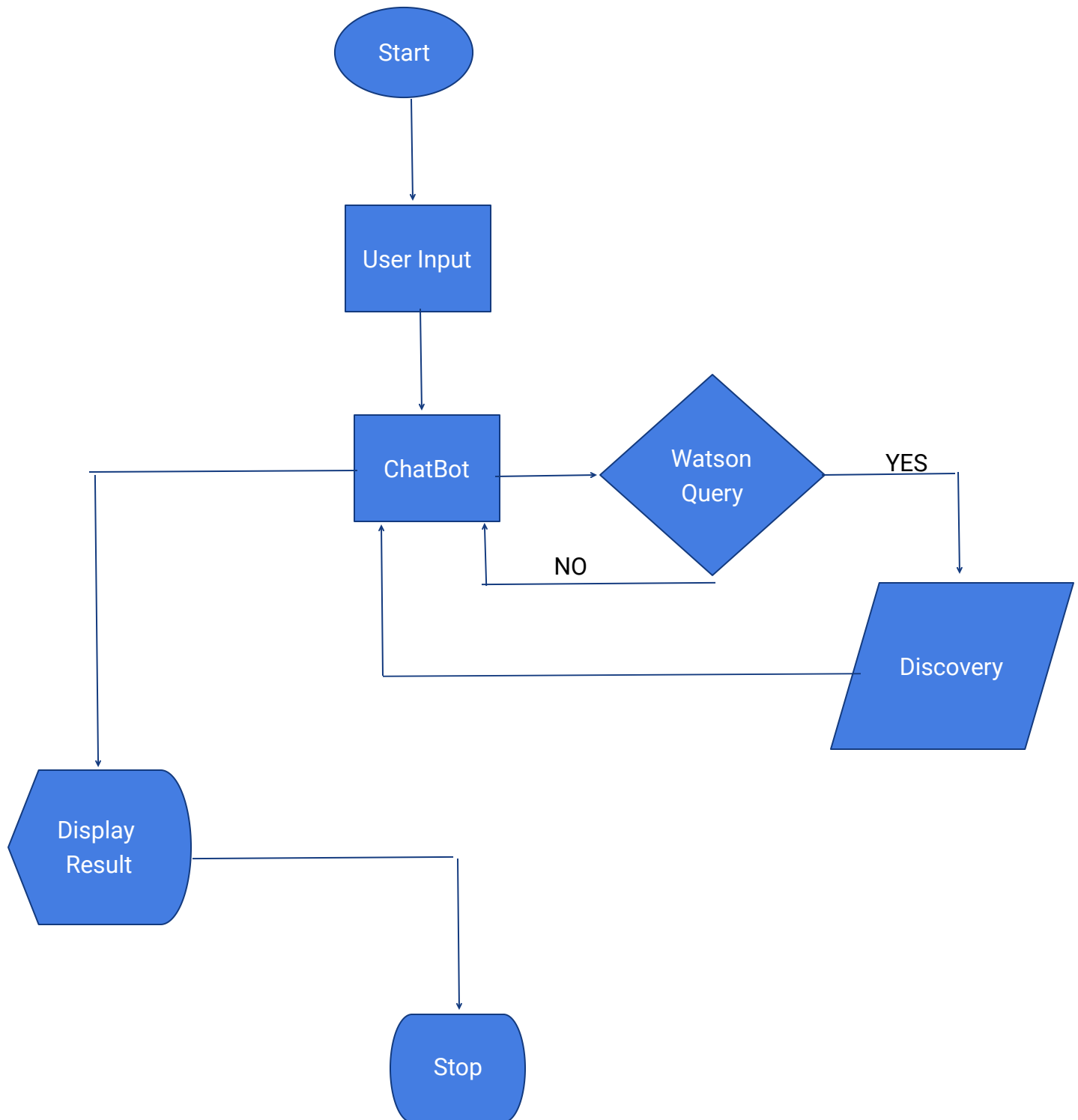
The screenshot shows a web browser window with the URL [https://node-red---sceu-gb.mybluemix.net/ui/#/0?socketid=d6vNLYU\\_aesc](https://node-red---sceu-gb.mybluemix.net/ui/#/0?socketid=d6vNLYU_aesc). The page title is "Smart Document Reader". The interface includes a search bar at the top right with the text "Search using DuckDuckGo". Below the search bar, there is a "Form" section with a text input field labeled "Type here!" containing the text "HI". Below the input field are two buttons: "SUBMIT" and "CANCEL". To the right of the form is a "Bot Answered" section. Below the form, there is a "Query" section with the text "YOU HI". The bot's response is displayed in the "Bot Answered" section, starting with "SMART BOT :". The response text is: "Namste! I am Smart Document Reader. How can I assist you today? I can help you with queries related to the manual User Guide ecobee3."

### Example 2:

The screenshot shows a web browser window with the same URL as Example 1. The page title is "Smart Document Reader". The interface includes a search bar at the top right with the text "Search using DuckDuckGo". Below the search bar, there is a "Form" section with a text input field labeled "Type here!" containing the text "how to set set screen brightness?". Below the input field are two buttons: "SUBMIT" and "CANCEL". To the right of the form is a "Bot Answered" section. Below the form, there is a "Query" section with the text "YOU how to set set screen brightness?". The bot's response is displayed in the "Bot Answered" section, starting with "SMART BOT :". The response text is: "You can customize the brightness of your ecobee3's screen. The brightness for both the active and standby screens can be configured independently. 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. On Thermostat: 1. Select Main Menu > Settings > Preferences 2. Select Screen brightness. 3. Adjust the values of the Active and Standby screen brightness. 4. Select Screen sleeps when I sleep if you want to make the screen blank during the Sleep activity period. The bright, easy-to-read touch screen on your ecobee3 thermostat makes it simple to review and adjust settings any time you want. The standby screen activates whenever the thermostat is not in use. It shows the current indoor temperature and outdoor weather conditions. 1 Current indoor temperature 2 Current outdoor weather conditions The standby screen is configurable. You can adjust: 1 Standby screen activation time (page 21) Standby screen brightness (page 21)"



## 5. Flow Chart



## **6. RESULT :**

## **6. RESULT :**

*Successfully built all the required functionalities for the project given as :*

- Created a customer care dialog skill in Watson Assistant
- Used Smart Document Understanding to build an enhanced Watson Discovery collection
- Created an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery
- Built a web application with integration to all these services & deploy the same on IBM Cloud Platform

## **7. ADVANTAGES AND DISADVANTAGES :**

### **Advantages :**

- Better alternative to the present customer care services.
- Very less or minimum man power required.
- Instant access and easy to use
- Free to use
- Easy to integrate and upgrade
- Built using Future technologies like AI/ML, IoT Cloud.

## **Disdvantages :**

- Will render many people unemployed.
- Requires Internet access to work
- Difficult to use for Uneducated people
- Risks related cyber security.

## **8. APPLICATIONS :**

- Could be used with various business who provides customer care services
- Can be Integrated through various Messenger apps like facebook messenger, Telegram or Slack
- Easy to deploy various manuals at one place and access them anytime anywhere.

## **9. CONCLUSION :**

*The SmartBot for Intelligent customer care was successfully built and deployed usind Node Red and Smart Document Understanding feature of Watson Discovery and trained on what text in the owners manual is important and what is not. This improved the answers returned from the queries.*

## 10. FUTURE SCOPE :

*Since the project is made using Technologies like AI/ML and furthermore uses IBM technologies like IBM Watson assistant and IBM discover, it already promises a lot of benefits and future scope. The chatbot are not a new thing in the market and hence using them for customer support seems to change the market abruptly. It is a win win situation for everyone.*

## 11. BIBILIOGRAPHY :



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- <https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application>
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