PROJECT REPORT

Topic – Intelligent Customer Help Desk with Smart Document Understanding

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1. Introduction

1.1 Overview

I have used the typical customer care chatbot experience but instead of relying on predefined responses, this dialog will provide a hook that can call out to other IBM Watson services for additional sources of information. In this case, it will be an owner's manual that has been uploaded into Watson Discovery.

1.2 Project Description

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. 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 owner's manual. So now, instead of "Would you like to speak to a customer representative?" we can return relevant sections of the owner's 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 owner's manual is important and what is not. This will improve the answers returned from the queries.

1.3 Scope of Work

1. Create a customer care dialog skill in Watson Assistant
2. Use Smart Document Understanding to build an enhanced Watson Discovery collection
3. Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery

4. Build a web application with integration to all these services & deploy the same on IBM Cloud Platform

2. Literature Survey

2.1 Existing Problem

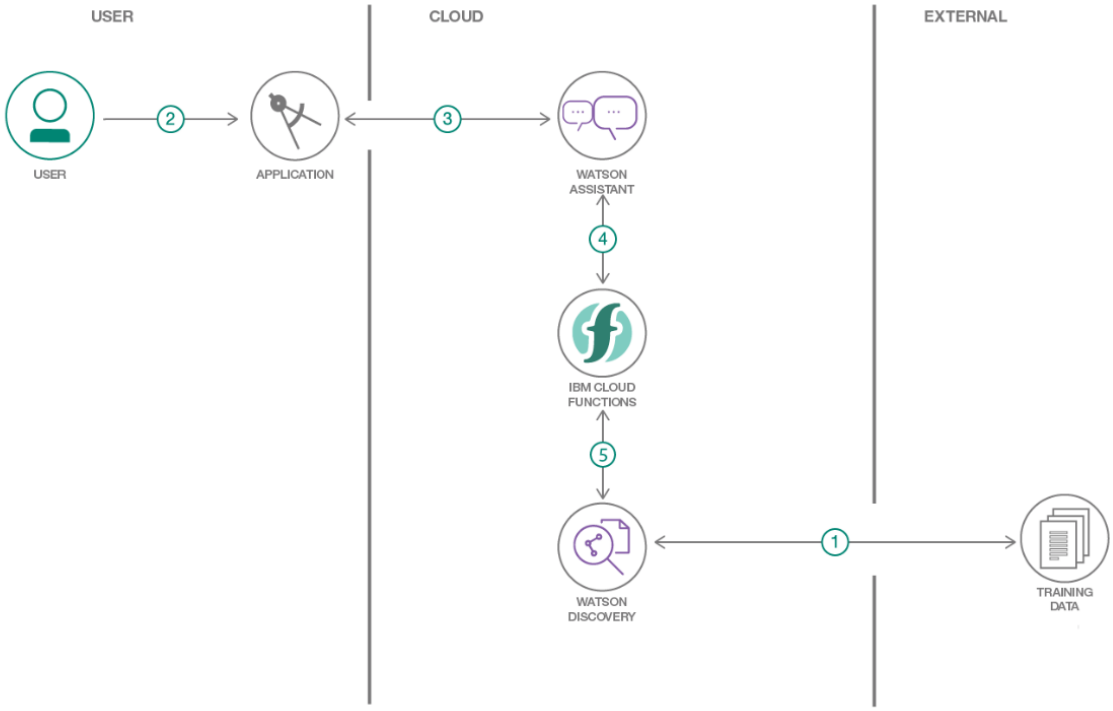
The age old system of recruiting customer care executives required them to be trained over time and provided with salary for their service. Moreover, if the company receives a huge number of product related queries, a large number of such customer care executives would have to be hired.

2.2 Proposed Solution

A feasible solution for the existing problem was to implement a chatbots. This could help to reduce the overall expenditure of the company. It could be trained with the store locations, company rules and other product related information.

3. Theoretical Analysis

3.1 Block Diagram



1. The document is annotated using Watson Discovery SDU
2. The user interacts with the backend server via the app UI. The frontend app UI is a chatbot that engages the user in a conversation.
3. Dialog between the user and backend server is coordinated using a Watson Assistant dialog skill.
4. If the user asks a product operation question, a search query is passed to a predefined IBM Cloud Functions action.
5. The Cloud Functions action will query the Watson Discovery service and return the results.

3.2 Software design

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

4. Methodology

4.1 Create IBM Cloud services

4.1.1 Watson Assistant

4.1.2 Watson Discovery

4.1.3 Node-RED

4.2 Configure Watson Discovery

4.2.1 Import the document

4.2.1.1 Launch the Watson Discovery tool and create a new data collection. Give the data collection a unique name. When prompted, select and upload the owner's manual. I have used the Ecobee User Guide. (Ecobee is a popular residential thermostat that has a wifi interface and multiple configuration options.)

4.2.2 Annotate with SDU

4.2.2.1 The goal is to annotate all of the pages in the document so Discovery can learn what text is important, and what text can be ignored. The more pages you annotate, the better the model will be trained.

4.2.3 Store credentials for future use

4.2.3.1 We will need to provide the service credentials such as Collection ID, Environment ID, API key and URL endpoint to access Discovery collection.

4.3 Create IBM Cloud Functions action

4.3.1 Create Web action

4.3.1.1 Create an action under cloud functions and add the necessary code that connects to the Discovery service, makes a query against the collection, and then returns the response.

4.3.1.2 Add the Discovery credentials under Parameters for that action.

4.4 Configure Watson Assistant

4.4.1 Create a dialog skill

4.4.1.1 Launch the Watson Assistant tool and create a new dialog skill. Select the Use sample skill option as the starting point.

4.4.2 Create new intent

4.4.2.1 Name the intent #Product_Information, and add a minimum of 5 example questions to be associated with it.

4.4.3 Create new dialog node

4.4.3.1 Name the node 'Ask about product' and assign it our new intent. Thus if Watson Assistant recognizes a user input associated with this intent it will direct the conversation to this node.

4.4.4 Enable Webhooks

4.4.4.1 Set up access to our WebHook for the IBM Cloud Functions action created in Step 4.3.

4.4.5 Test the assistant

4.4.5.1 From the Dialog panel, click the Try it button located at the top right side of the panel.

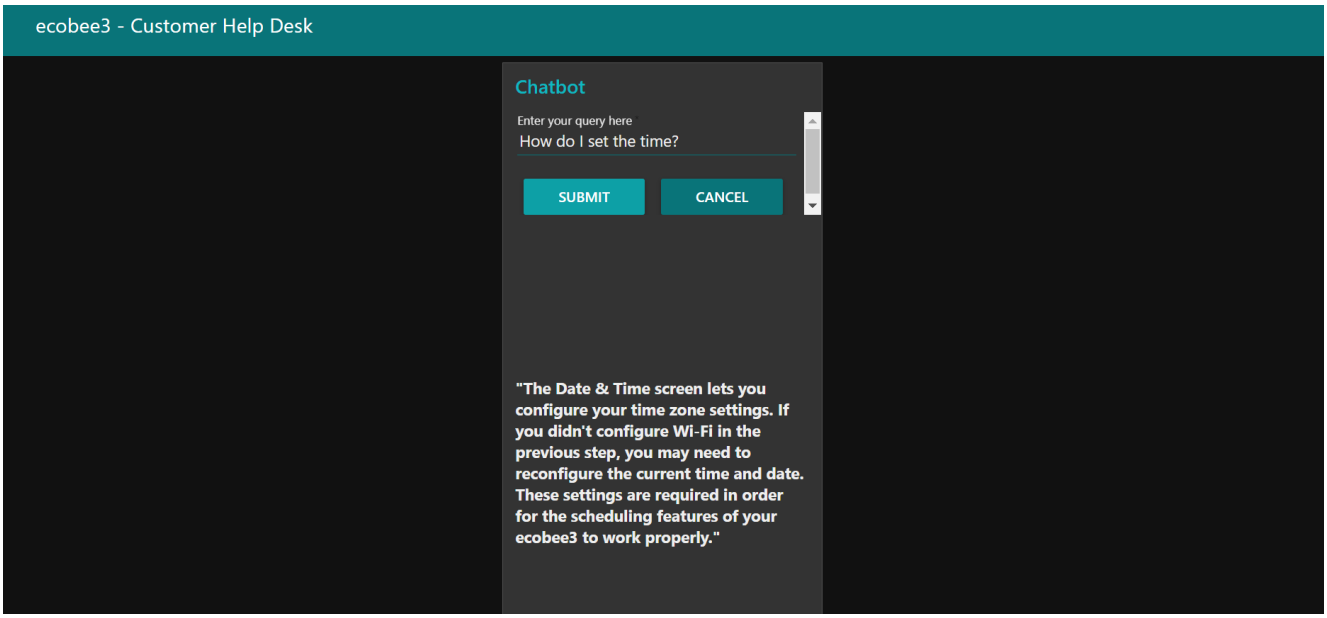
4.4.5.2 Verify that the call was successfully completed by clicking on the Manage Context button at the top right.

4.5 Build Node-RED Flow to integrate all services

4.5.1 **Build the flow**

4.5.1.1 Build the Node-RED flow and configure the nodes to integrate all the services above.

5. Result



6. Conclusion

Successfully created a chatbot by integrating the Watson AI services such as Watson Assistant, Discovery, Cloud functions and deployed it using Node-RED.

7. Future Scope

7.1 The chatbot could be trained more to provide more relevant responses.

7.2 The document can be annotated more precisely so that the model could be trained more efficiently.

7.3 The UI of the chatbot could be improved.

8. References

8.1 https://github.com/IBM/watson-discovery-sdu-with-assistant

8.2 https://www.youtube.com/watch?v=Jpr3wVH3FVA

8.3 https://www.youtube.com/watch?v=-yniuX-Poyw&feature=youtu.be