

# SmartBridge Internship Project Report

**Project Title:** Intelligent Customer Help Desk with Smart Document Understanding

**Video Demo Link (on YouTube):** <https://youtu.be/pwWBAXwwtSE>

**Node-Red Dashboard Link:** <https://node-red-glkyu.eu-gb.mybluemix.net/ui>

**Project Scope:** The scope of this project is to develop a chatbot to interact with customers and solve their queries using AI. IBM watson services will be used to develop the chatbot and data will be provided to train an apt ML model for the task (i.e. IBM Watson Assistant).

## 1. Introduction

### 1.1 Existing Problem

A chatbot is an application of AI that is capable of mimicking human conversations. It finds many applications today. For eg., the use case

### 1.2 Purpose

The objective here is to build a Hospital Customer Care Chatbot using IBM watson services like Discovery and Watson Assistant. Discovery is to be used for its Smart Document Understanding for improved training. A web dashboard is to be built by integrating the mentioned services and then should be deployed on IBM Cloud Platform.

## 2. Literature Survey

### 2.1 Existing Problem

Customer care is necessary for any organisation to allow communication with customers. Efficiency of the customer care degrades when it is stretched thin for many reasons like customers may contact customer care multiple times for problems whose solutions are readily available in product manuals or like today with lockdown imposed, their staff strength may be reduced.

This project explores the problem faced by a hospital customer care due to lockdown.

### 2.2 Proposed Solution

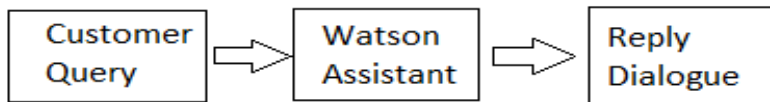
The proposed solution is introduce AI in customer service so as to handle common questions and tasks. ChatBot can be introduced for handling queries on text messages while a speech-to-text & text-to-speech conversion can be integrated for voice calls.

Here we focus on the ChatBot only.

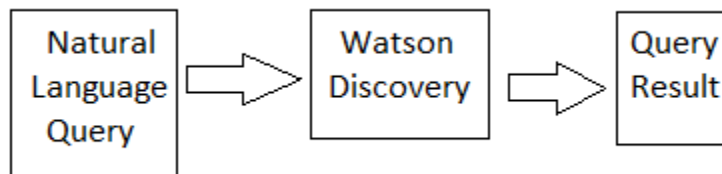
### 3. Theoretical Analysis

#### 3.1 Block Diagram

Watson Assistant:



Watson Discovery:



#### 3.2 Hardware/Software Designing

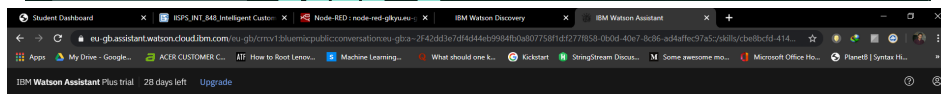
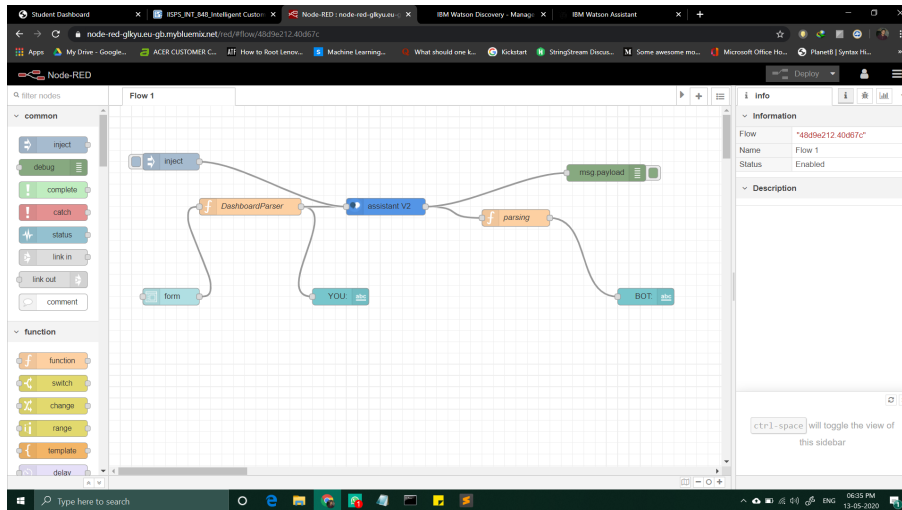
The watson service required for this project i.e. "watson discovery" and "watson assistant" are readily available on IBM cloud.

Apart from them, "node-red service" and "IBM cloud function service" are also required for proper integration between these services.

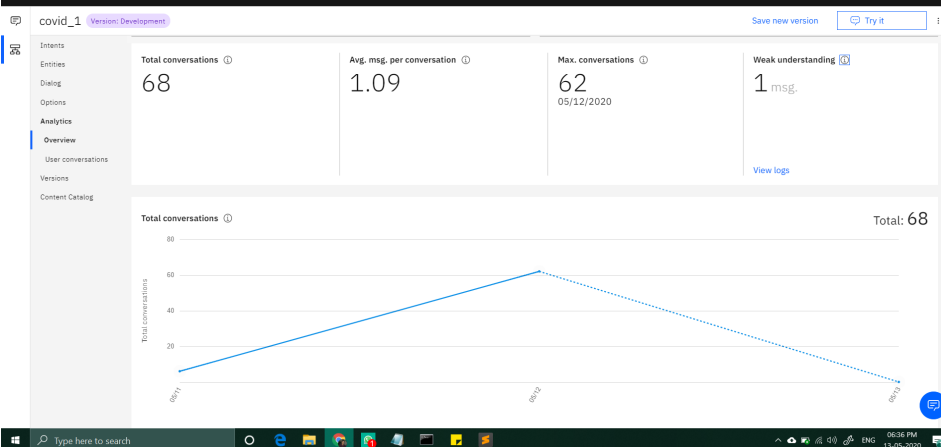
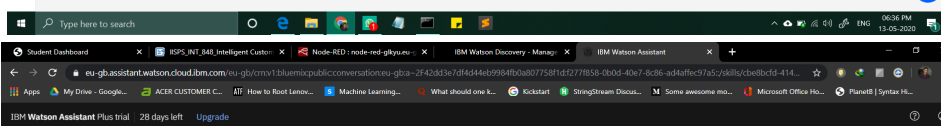
### 4. Experimental Investigations

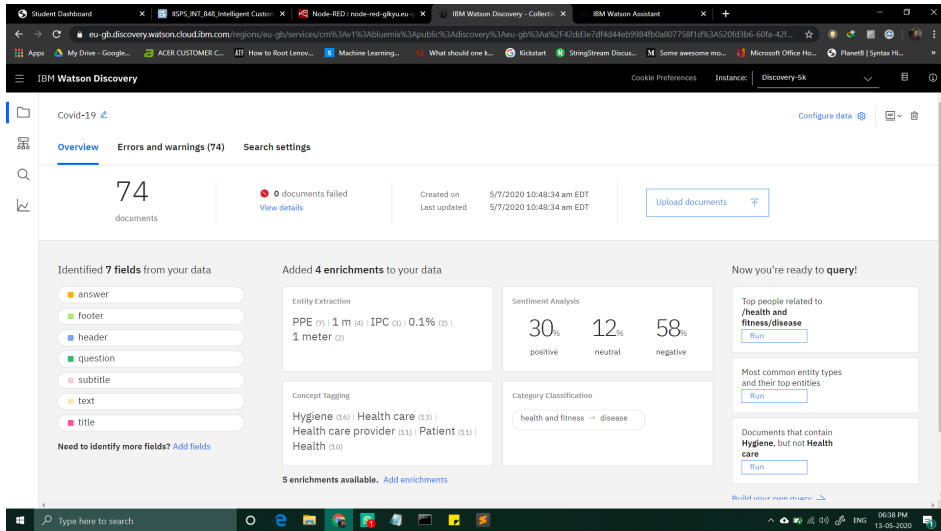
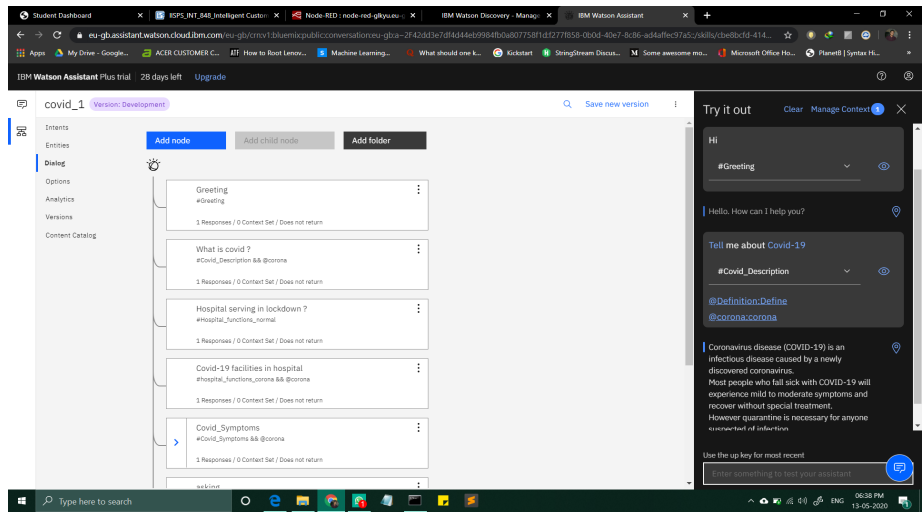
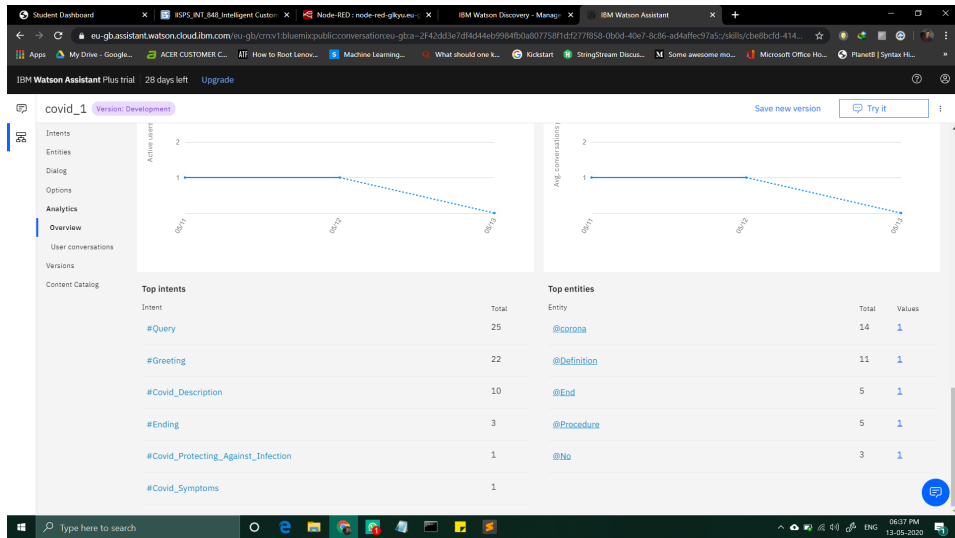
Watson Discovery was used to learn from a guidelines document issued by the government.

To test the accuracy, a list of common natural language queries was made. The result of those queries was marked as accurate or not for training the machine. With this practice, the results were improved with relevant answers being returned.

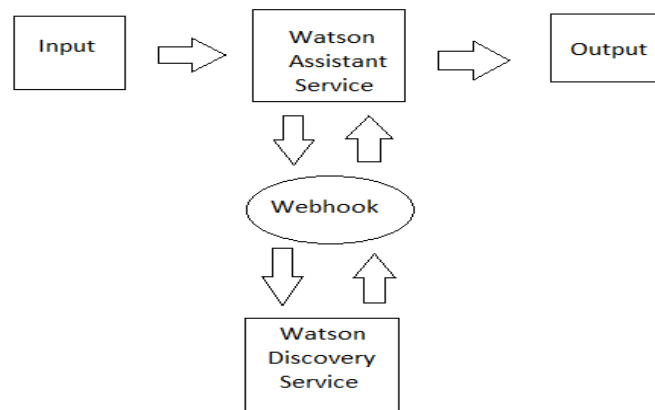


Intents (9) ↑	Description	Modified T1	Conflicts T1	Examples T1
<input type="checkbox"/>	#Covid_Cleaning_Disinfecting	How to clean and disinfect.	4 days ago	11
<input type="checkbox"/>	#Covid_Description	Overview of Covid 19.	3 days ago	11
<input type="checkbox"/>	#Covid_Protecting_Against_Infection	How to prevent infection.	4 days ago	13
<input type="checkbox"/>	#Covid_Symptoms	Symptoms related to Covid 19.	2 days ago	11
<input type="checkbox"/>	#Ending		2 days ago	7
<input type="checkbox"/>	#Greeting		4 days ago	6
<input type="checkbox"/>	#hospital_functions_corona		4 days ago	6
<input type="checkbox"/>	#Hospital_functions_normal	About hospital	4 days ago	6
<input type="checkbox"/>	#Query	Question about anything	2 days ago	7





## 5. Flowchart



From the flowchart, we can see that the input is passed to the assistant service. If the "query intent" is determined in the input, it contacts the discovery service through webhook.

The appropriate output is then processed to the user.

## 6. Result

The chatbot was successfully made and a prototype of the chatbot was made available on node-red dashboard.

The dashboard link and demo video link have been provided in the beginning and have been provided below also.

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### 7.1 Advantages

- Introduction of chatbot introduces automation in customer service.
- A human team can handle a limited no. of customers. In contrast a chatbot can cater to 1000s of customers at a time as per its resources.
- Scaling up a chatbot is easier than scaling up a customer care team for increased demands.
- Resolution time may be faster for chatbots.

### 7.2 Disadvantages

- A chatbot may not be able to handle complex customer queries that are new to it.
- It might not be able to resolve complaints and will thus need to transfer call to a

human, increasing the resolution time.

## **8. Applications**

- It can be utilised by organisations with lack of resources to hire a customer care team.
- It can be used by organisations to filter out trivial queries that may not necessarily require human employee attention.

## **9. Conclusion**

The chatbot is an important implementation of AI for human conversations. It enables a machine handle otherwise trivial tasks and resolve most of customer's questions. It is thus utilised by many organisations, resulting in saving time & money.

It can thus be concluded that a chatbot was successfully implemented in this project.

## **10. Future Scope**

With advancements in NLP and Deep Learning, we might be able to train the chatbot so well enough that it may eliminate the requirement of humans to handle customer's queries and complaints.