

# **Chatbot To Shop For Essentials During Pandemic Using Watson Assistant**

**Project Report**

**Submitted  
by**

**Dr.K.Muthumeenakshi  
Associate Professor  
Sri Sivasubramaniya Nadar College of Engineering  
Kalavakkam  
Chennai - 603110.**



## **Table of Contents**

<b>Chapter</b>	<b>Title</b>
	ABSTRACT
1	INTRODUCTION
1.1	Overview
1.2	Purpose
2	LITERATURE SURVEY
2.1	Existing Problem
2.2	Proposed Solution
3	THEORITICAL ANALYSIS
3.1	Block Diagram
3.2	Software Design
4	EXPERIMENTAL INVESTIGATIONS
5	FLOW CHART
6	RESULTS
7	ADVANTAGES AND DISADVANTAGES
8	APPLICATIONS
9	CONCLUSION
10	FUTURE SCOPE
11	BIBLIOGRAPHY
	APPENDIX
A.	Source Code
B.	Additional Chatbot Implementation

## **ABSTRACT**

Today, because of social distancing and other issues it can be risky for some people to shop for essential items in person. People prefer online shopping and wish to take home delivery. For this purpose, chatbots are preferred which help the user to provide the list and price of items available in the store, take orders for home delivery. Thus, the main aim of this project is to develop a shopping chatbot that helps with this issue by giving people an online option to shop for essentials. The chatbot is built with the help of IBM Watson assistant. The developed chatbot have the capabilities such as providing the list of items in the store and their price, display if there are any offers or discounts. The bot also takes details like name, contact number, address, and the items to place the order.

## **1. INTRODUCTION**

### **1.1 Overview**

With the recent advancements in artificial intelligence, deep learning, computers and machines have started to work smartly and they are capable of impersonating human being. Chatbots are conversational software agents developed by natural language processing. Nowadays, supermarkets started to use such software agents to help their customers find their requirements, place orders and provide door delivery. As supermarkets and shops are turning into online shops, it is necessary to build software applications such as chatbots to suit their needs.

### **1.2 Purpose**

Development of chatbots have become necessary to provide 24x7 service to the customers thus providing hassle free shopping service. Thus customers need not travel to the markets instead get their needs at doorstep. Over and above, the entire world is suffering due to COVID 19 pandemic which further restricts people to move out of their home even for their daily essentials. This situation has forced the people to stay safe at home and buy their daily essentials online. Hence, this project proposes a chatbot application to shop for essentials during this pandemic. The chatbot is developed using IBM Watson Assistant, a powerful AI product that helps to build, train and develop conversion into an application.

## **2. LITERATURE SURVEY**

Chatbots can be goal based, knowledge based and service based. Goal based chatbots are designed for a specific task and used for conversation to get information from the users. Knowledge based bots provide information to the user based on the knowledge they get from their trained data sources. Service based bots provide personal or commercial service to the users. Shopping bot is an example for service based chatbot category. Chatbots can be developed using many available assistant services such as Microsoft LUIS, Chatfuel, Google Dialogflow, Amazon Lex and IBM Watson.

### 2.1 Existing Problem:

There are many chatbots available for ecommerce applications. However, most of them have lack of training and lead to errors during conversation.

### 2.2 Proposed Solution:

This project proposed a well trained chatbot suitable for online shopping of daily essential items for a particular area.

## 3. THEORITICAL ANALYSIS

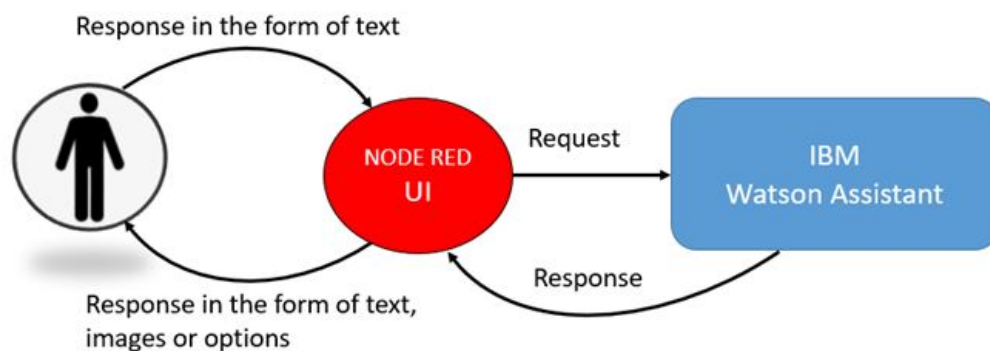
Chatbot : A chatbot provides interaction between machines and human being in the form of a question answering system. The main tasks performed by a chatbots are:

- a. Analysis of user inputs
- b. Response to users

A chatbots analyses user requests and should appropriate response to the users. To perform these tasks effectively the chatbots should be trained well. The chatbot developed in this project is well trained to perform the task expected as required for a shopping. The services used in this chatbot are

- a. IBM Watson Assistant
- b. Node-Red

### 3.1 Block Diagram



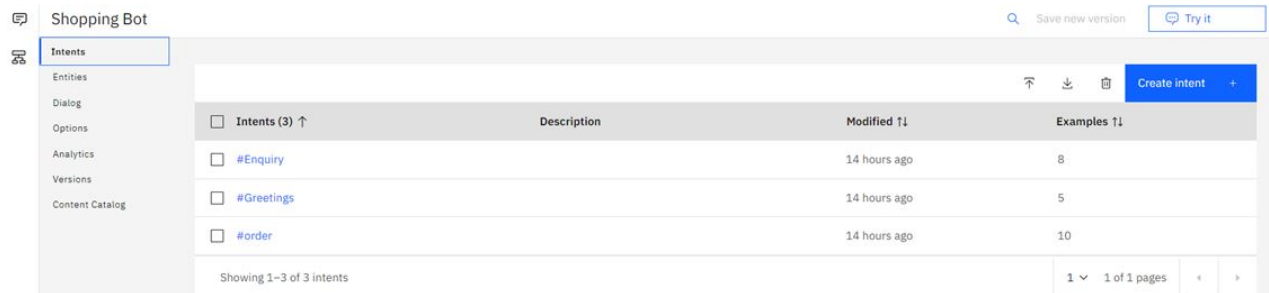
### 3.2 Software Design and Implementation:

The components used to build the chatbot include

1. Intent: An intent represents the purpose of a user's input. Intents are defined for each type of user request depending on the application.
2. Entity: An entity is an object that is relevant to the intents and provides a specific context for an intent.
3. Dialog: A dialog is a branching conversation flow that defines responses to the defined intents and entities. The dialog builder is used to create conversations with users and provide responses.

The following intents and entities are used to build the bot. The system entity @sys-number is also used.

#### Intents:



The screenshot shows the 'Intents' tab in the Microsoft Bot Framework interface for a 'Shopping Bot'. The left sidebar contains navigation links: Intents, Entities, Dialog, Options, Analytics, Versions, and Content Catalog. The main area displays a table of intents. At the top right of the main area are buttons for 'Save new version' and 'Try it'. Below these are icons for sorting, filtering, and deleting, followed by a 'Create intent' button with a plus icon. The table has columns for 'Intents (3) ↑', 'Description', 'Modified ↑↓', and 'Examples ↑↓'. It lists three intents: '#Enquiry' (14 hours ago, 8 examples), '#Greetings' (14 hours ago, 5 examples), and '#order' (14 hours ago, 10 examples). At the bottom, it says 'Showing 1-3 of 3 intents' and '1 of 1 pages'.

Intents (3) ↑	Description	Modified ↑↓	Examples ↑↓
<input type="checkbox"/> #Enquiry		14 hours ago	8
<input type="checkbox"/> #Greetings		14 hours ago	5
<input type="checkbox"/> #order		14 hours ago	10

Showing 1-3 of 3 intents

1 of 1 pages

Entities:

Shopping Bot

Intents

Entities

My entities

System entities

Dialog

Options

Analytics

Versions

Content Catalog

Entity (12) ↑

Values

Modified ↑

@combo	Cut pack I, Pack V, Pack IV, Pack III, Pack II, Pack I, Cut pack II	12 hours ago
@confirm	confirmveg, notconfirmveg, notconfirmfruit, confirmfruit	14 hours ago
@covid	gloves, shield, face mask, sanitizer	12 hours ago
@deliveryarea	Adyar, Guindy	13 hours ago
@deliverystreet	First Cross Street, Second Main Road, Third Main Road, First Main Road, Second Cross Street, Third Cross ...	13 hours ago
@email	email	14 hours ago
@Enquiry	items, Thank you, offers, Price chart, no, safety, combo, fruits, veggies	11 hours ago
@fruits	pomegranate, papaya, grapes, banana, apple, orange	14 hours ago
@Greetings	Good Afternoon, Good evening, Good Morning	14 hours ago
@order	yes, order	14 hours ago
@payment	UPI, Card, COD	14 hours ago
@veggies	peas, cabbage, chilli, coconut, beetroot, beans, carrot, potato, tomato, onion	14 hours ago

Showing 1–12 of 12 entities

1 1 of 1 pages

Shopping Bot

Intents

Entities

My entities

System entities

Dialog

Options

Analytics

Versions

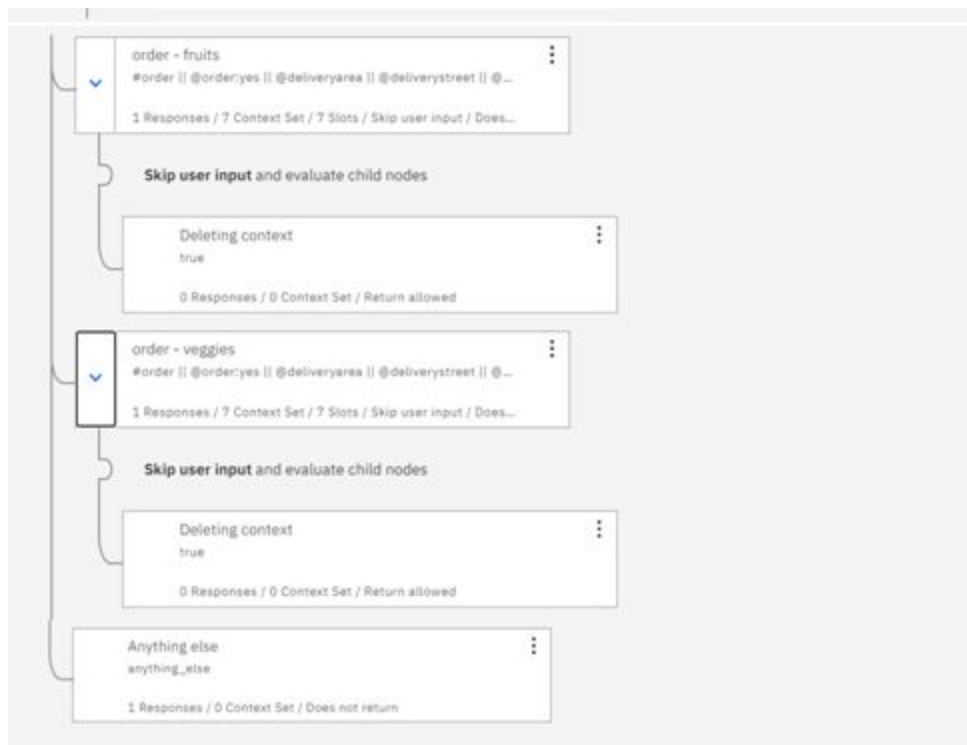
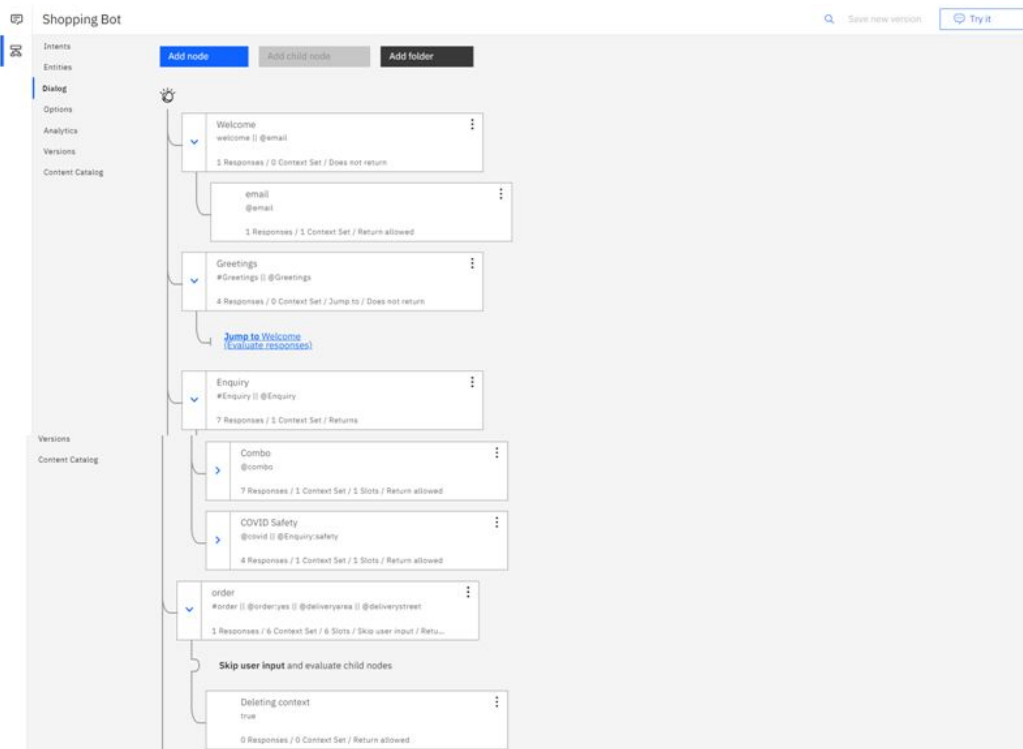
Content Catalog

The following entities are prebuilt by IBM to recognize references to things like numbers and dates in user input. Turn on a system entity to start using it. You cannot edit system entities. [Learn more](#)

New system entities are available that are even better at detecting dates, times, and numbers. Go to [Options>System entities](#) to enable them.

Name (5)	Description	Status
@sys-number	Extracts numbers mentioned from user examples as digits or written as numbers. (21)	On
@sys-percentage	Extracts amounts from user examples including the number and the % sign. (15%)	Off
@sys-currency	Extracts currency values from user examples including the amount and the unit. (20 cents)	Off
@sys-date	Extracts date mentions (Friday)	Off
@sys-time	Extracts time mentions (at 10)	Off

## Dialog Flow:





## 4. EXPERIMENTAL INVESTIGATIONS


The chatbot is developed using IBM Watson. The services uses are assitant and skill. A skill is developed and the flow of conversation is experimentallu verified at every step. A sample experimental investigation is shown below.

Try it out

Clear Manage Context 2

Welcome to Garden

Hello Sir/Madam, I am PEPPER, the Chatbot of Garden. Kindly provide your Name and email id.



My name is Meenakshi and my id is meena@gmail.com

Irrelevant

@email:email

Thank you. Your mail id meena@gmail.com is taken for future reference. I am capable of providing the list of items, offers and take orders. How may I help You?

Item list

#Enquiry

@Enquiry:items

@Enquiry:Price chart

Item List

Please go through the menu for vegetables, fruits, combo and COVID essentials. What do you like to go with?

Use the up key for most recent

Try it out

Clear Manage Context 2

Welcome to Garden

- Vegetables
- Fruits
- Combo
- COVID Needs

DON'T MISS IT !!

2% OFF on Purchase of Rs.1000+ It starts

4% OFF on Purchase of Rs.1500+ It starts

combo

Irrelevant

@Enquiry:combo

Special Combo List

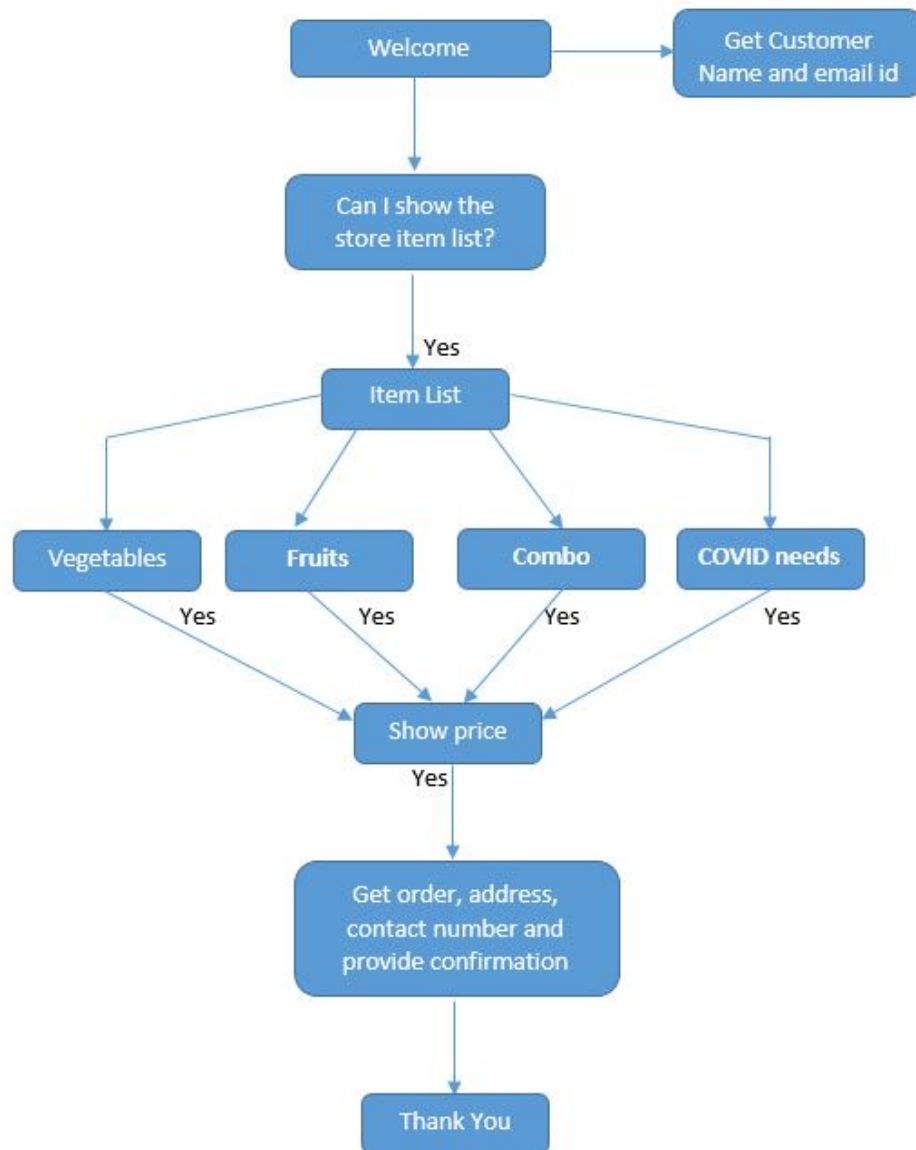
All the packs in the combo are available. Enter your choice of pack.

Combo	Price (Rs.)
Pack I (onion, tomato, potato, beans, carrot)	60
Pack II (onion, tomato, cabbage, peas, carrot)	65
Pack III (onion, tomato, beetroot, beans, peas )	70
Pack IV (apple, banana and pomegranate)	140
Pack V (apple, banana and orange)	120
Cut Pack I (For pulav / biryani)	60
Cut Pack II (For meal)	80

Use the up key for most recent

Enter something to test your assistant


## 5. FLOW CHART



## 6. RESULTS

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**




**Welcome to Garden**  
Hello Sir/Madam, I am PEPPER, the Chatbot of Garden. Kindly provide your Name and email id.

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**



**Welcome to Garden**  
Hello Sir/Madam, I am PEPPER, the Chatbot of Garden. Kindly provide your Name and email id.

My name is Meenakshi. My email id is meena@gmail.com


Thank you. Your mail id meena@gmail.com is taken for future reference. I am capable of providing the list of items, offers and take orders. How may I help You?

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**

Show me the item list



**Item List**  
Please go through the menu for vegetables, fruits, combo and COVID essentials. What do you like to go with?

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**

Item	Price (kg)
Apple	125
Orange	90
Pomegranate	150
Banana	80
Papaya	75
Grapes	80

List of Fruits  
All the fruits in the list are available. Enter your choice of fruit.

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**

Item	Price (kg)
Onion	75
Tomato	50
Potato	60
Beans	72
Carrot	68
Cabbage	45
Beetroot	55
Peas	90
Coconut	30
Chilli	45

List of Vegetables  
All the vegetables in the list are available. Enter your choice of vegetable.

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**

How many kgs do you want

Potato

2 kg

We accept COD, Card, Net banking and UPI payments. Which mode of payment do you prefer?

UPI

For home delivery, Enter your door no

234

Enter your street

I main road

[Type something...]

Build your own assistant using  
IBM Watson Assistant

**Assistant preview**

Enter your street

I main road

Enter your area

Adyar

Enter your contact number

9444320048

Thank you. Your order 2 kg of potato is successfully placed. Offers, if applicable will be included. Your invoice will be sent to meena@gmail.com. Please pay using UPI. Your item will be delivered to 234, First Main Road, Adyar, Chennai. Confirmation SMS for Delivery and Payment will be sent to 9444320048. Thank you for shopping with us. Have a nice day.

[Type something...]

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

ok can I see the price list



#### Item List

Please go through the menu for vegetables, fruits, combo and COVID essentials. What do you like to go with?

combo

Combo	Price (Rs)
Pack I (onion, tomato, potato, beans, carrot)	60
Pack II (onion, tomato, cabbage, peas, carrot)	65
Pack III (onion, tomato, beetroot, beans, peas)	70

Type something...

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

combo

Combo	Price (Rs)
Pack I (onion, tomato, potato, beans, carrot)	60
Pack II (onion, tomato, cabbage, peas, carrot)	65
Pack III (onion, tomato, beetroot, beans, peas)	70
Pack IV (apple, banana and pomegranate)	140
Pack V (apple, banana and orange)	120
Cut Pack I (For pulav / biryani)	60
Cut Pack II (For mas)	80

#### Special Combo List

All the packs in the combo are available. Enter your choice of pack.

Give me pack II

It includes onion, tomato, cabbage, peas and carrot each 0.25 kg and Costs Rs. 65/- only. Can I proceed with the order?

Type something...

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

It includes onion, tomato, cabbage, peas and carrot each 0.25 kg and Costs Rs. 65/- only. Can I proceed with the order?

No

Ok. How can I help you?

List again



#### Item List

Please go through the menu for vegetables, fruits, combo and COVID essentials. What do you like to go with?

Type something...

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

COVID needs

COVID Needs	Price (Rs)
Face mask (pack of 5)	60
Sanitizer (100 ml)	75
Hand gloves (one pair)	40
Shield	50

#### COVID Essentials

Enter your choice from the list.

Face Mask

Face mask (pack of 5) - costs Rs. 50/- . Can I proceed with the order?

Yes please

How many do you want

Type something...

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

Enter your street

3rd cross street

Enter your area

Guindy

Enter your contact number

9879878700

Thank you. Your order 1 number of Pack II face mask is successfully placed. Offers, if applicable will be included. Your invoice will be sent to [meena@gmail.com](mailto:meena@gmail.com). Please pay using COD. Your item will be delivered to 67 , Third Cross Street , Guindy , Chennai. Confirmation SMS for Delivery and Payment will be sent to 9879878700 . Thank you for shopping with us. Have a nice day.

Type something...

Build your own assistant using  
IBM Watson Assistant

#### Assistant preview

9879878700

Thank you. Your order 1 number of Pack II face mask is successfully placed. Offers, if applicable will be included. Your invoice will be sent to [meena@gmail.com](mailto:meena@gmail.com). Please pay using COD. Your item will be delivered to 67 , Third Cross Street , Guindy , Chennai. Confirmation SMS for Delivery and Payment will be sent to 9879878700 . Thank you for shopping with us. Have a nice day.

Offers?

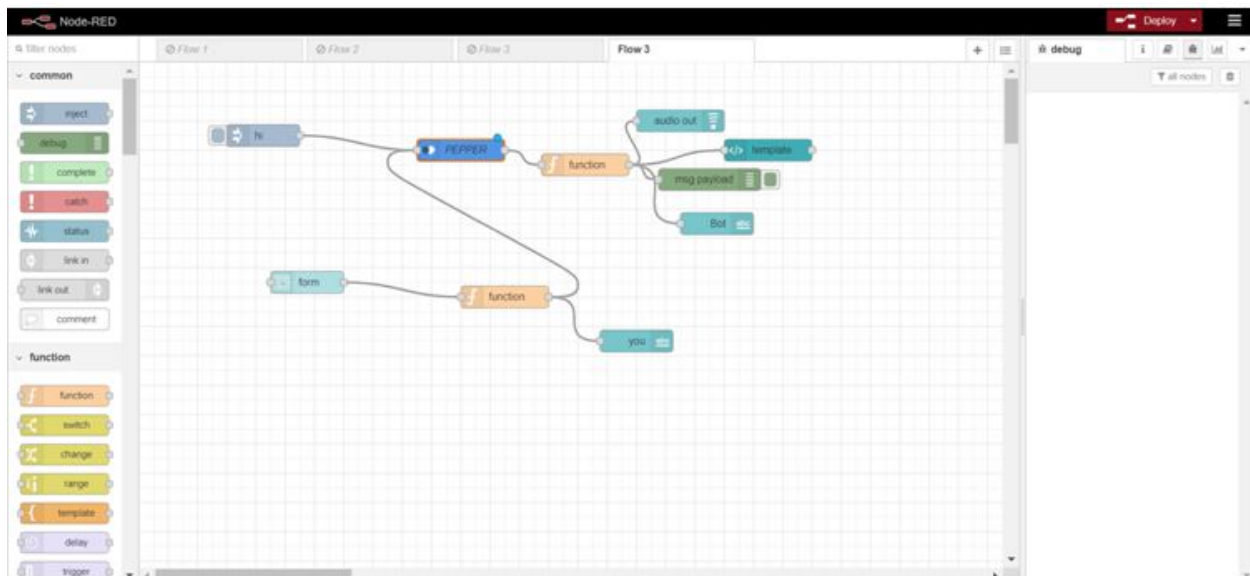
We have 5% off on purchase of Rs.200/- and above. We have 10% off on purchase of Rs.500/- and above.

OK Thank You

Welcome. Have a nice day.

Type something...

## Node-Red Integration:



## Output from Node-Red:

**Chatbot**

Enter your input \*

Vegetables

SUBMIT CANCEL

you

Bot

Welcome. Have a nice day.

Welcome to Garden for Fresh Fruits and Vegetables

**Chatbot**

Enter your input \*

Item List

SUBMIT CANCEL

you

Bot

Item List

Welcome to Garden

- Vegetables
- Fruits
- Combo
- COVID Needs

**Chatbot**

Enter your input \*

Good Morning

SUBMIT CANCEL

you

Good Morning

Good Morning. I can provide you with the item list with price and offers.

Welcome to Garden for Fresh Fruits and Vegetables

**Chatbot**

Enter your input \*

Vegetables

SUBMIT CANCEL

you

Bot

List of Vegetables

Item	Price (kg)
Onion	75
Tomato	50
Potato	60
Beans	72
Carrot	68
Cabbage	45
Beetroot	55
Peas	90
Coconut	30
Chilli	45

**Chatbot**

Enter your input \*

Beetroot

SUBMIT CANCEL

you

Bot

How many kgs do you want

Welcome to Garden for Fresh Fruits and Vegetables

**Chatbot**

Enter your input \*

2

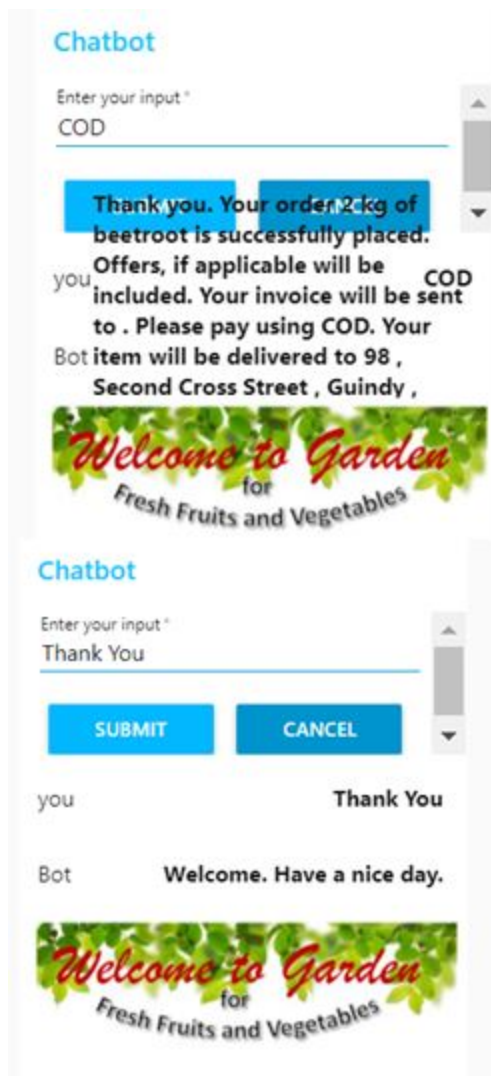
SUBMIT CANCEL

you

2

We accept COD, Card, Net banking Bot and UPI payments. Which mode of payment do you prefer?

Welcome to Garden for Fresh Fruits and Vegetables



## 7. ADVANTAGES AND DISADVANTAGES

The chatbot has the following advantages:

1. Saves time for the customer. During this pandemic, use of this chatbot helps them to be safe at home.
2. Available 24x7.
3. Provides responses via email and mobile.

Few disadvantages are

1. Does not have the capability to take multiple orders simultaneously.
2. Can misunderstand requests for untrained phrases.



## **8. APPLICATIONS**

Applications of shopping chatbot include

1. ecommerce
2. Store shopping
3. Supermarkets

## **9. CONCLUSION**

This project proposes a chatbot which can be used for online shopping. It uses IBM Watson assistant and Node-RED. The chatbot is capable of providing items available, show price list and take orders from the customers. Particularly, this chatbot will be very useful for online shopping during this COVID pandemic as it will be risky common public to move out of their home.

## **10. FUTURE SCOPE**

As a future extension, this chatbot can be modified to take multiple orders from the user in one conversation.

## **11. BIBLIOGRAPHY**

1. [https://www.ibm.com/cloud/architecture/tutorials/watson\\_conversation\\_support/](https://www.ibm.com/cloud/architecture/tutorials/watson_conversation_support/)
2. Phd, Mohammad & Hussain, Omar. (2018). A Survey on Chatbot Implementation in Customer Service Industry through Deep Neural Networks. 54-61. 10.1109/ICEBE.2018.00019.
3. Adam, M., Wessel, M. & Benlian, A. AI-based chatbots in customer service and their effects on user compliance. Electron Markets (2020). <https://doi.org/10.1007/s12525-020-00414-7>.
4. [www.google.com](http://www.google.com)

## APPENDIX

### **Preview Link for Watson Assistant:**

<https://web-chat.global.assistant.watson.cloud.ibm.com/preview.html?region=eu-gb&integrationID=2523d07f-4aa8-444e-b42f-8b51412ea01b&serviceInstanceID=d130743d-702a-4684-a359-73e6e979f391>

### **A. SOURCE CODE**

Function nodes of NODE-RED:

```
msg.payload=msg.payload.text;
return msg;
```

```
if(msg.payload.output.generic[0].response_type=="image"){
    msg.url = msg.payload.output.generic[0].source
    msg.payload = msg.payload.output.generic[0].title
}
else{
    msg.url="https://i.ibb.co/XZ13xj6/welcome1.jpg"
    msg.payload = msg.payload.output.text[0];
}
return msg;
```

### **Webchat Link:**

[https://node-red-ijqwz-2020-10-20.eu-gb.mybluemix.net/ui/#!/0?socketid=t1U7\\_olxlzYrMB\\_MAAAw](https://node-red-ijqwz-2020-10-20.eu-gb.mybluemix.net/ui/#!/0?socketid=t1U7_olxlzYrMB_MAAAw)

**(Note:** The store delivers the daily essentials only to a restricted zone which includes First Main Road, Second Main Road, Third Main Road, First Cross Street, Second Cross Street and Third Cross Street of Adyar and Guindy)



## **B. Additional Chatbot Implementation using Watson Assistant**

An additional / alternate chatbot has been implemented using Watson Assistant. The preview link for the same is given below for reference.

<https://web-chat.global.assistant.watson.cloud.ibm.com/preview.html?region=eu-gb&integrationID=f4352a8f-350f-4889-9d19-14eb5e2309a4&serviceInstanceID=d130743d-702a-4684-a359-73e6e979f391>