

# **Smart Restaurant Bot**

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# 1. INTRODUCTION

A bot is a software application that performs automated task and chatbots come under the category of bots that live in various chat platforms. A chatbot can converse with humans so the idea of conversation is primary to a chatbot. What are chatbots, and where did they come from? This introduction to chatbots explores their early roots in psychology and the ironic twist behind the creation of the first chatbot that paved the way for modern chatbots. Today, chatbots have become a popular customer service solution able to facilitate sales, complete online tasks, and more.

## 1.1 Overview

**Essentially chatbots are of two types:**

**Command based:**

Chatbots that function on predefined rules and can answer to only limited queries or questions. Users need to select an option to determine their next step.

**Intelligent/AI Chatbots:**

- ◆ Chatbots that leverage Machine Learning and Natural Language Understanding to understand the user's language and are intelligent enough to learn from conversations with their users.
- ◆ You can converse via text, speech or even interact with a chatbot using graphical interfaces.
- ◆ Chatbots run on platforms such as Facebook Messenger, Slack, Telegram, Skype, SMS and even on websites. Each platform has its own salient features which determine the possible ways in which the chatbot can interact with the user, however, the actual behavior of the chatbot is determined by the bot itself.

## 1.2 Purpose

- ❖ The purpose of chatbots is to scale business teams and help them in maintaining a cordial relationship with their customers. This helps businesses cut down on operational costs, save time and ensure lucrative productivity as all the basic and monotonous requests are handled by the chatbot while complex queries are taken care of by the support team.
- ❖ Chatbots can help customers make e-commerce purchases, answer customer service questions, monitor employee's or customer's satisfaction, improve response rate from customers, deliver a personalized experience, derive business intelligence, automate repetitive tasks and we can actually come up with a chatbot use case for every single business or industry.
- ❖ Where do you want to eat tonight? Not sure? Ask a chatbot.
- ❖ Much like the product recommendation chatbots, restaurant chatbots can provide recommendations based on cuisine, location, and price range. Some chatbots will even make reservations for you or take your order online.
- ❖ Time is valuable for every company. Artificial Intelligence provides many solutions for estimating the candidates skills. AI-based software only needs a few seconds to analyze big amounts of data and provide understandable results that can be considered by decision makers. Saving time, AI solutions also save money and resources.

## 2. LITERATURE SURVEY

AI technology however has touched people in their day to day activity in many ways. Beginning from usage of smartphones keyboards to voice-enabled assistants in tabs and laptops and even the persons immediate personal technology supporting devices – technology and its innovation has reached each end of the world among the people when compared to how it was or how it would be or how it is perceived. Even exploitation of AI can occur for the welfare of individuals of country who involve themselves in sectors like financial services, health & safety services, education and governance. However, AI is almost implemented in every sector of the economy. “Implementing AI software simply eliminates mundane tasks and time-consuming data analysis to serve as an ongoing problem-solver for HR. In the words of Dr. A.P.J. Abdul Kalam (2010), “The turning point in the process of growing up is when you the core strength within you that survives all hurt”. Nowadays chatbots have been widely adopted in many industries to automatically answer users' questions and requests via chat interfaces. While it has become much easier to develop a chatbot system, the system itself is a complex system in nature. It is a challenge to evaluate and compare various chatbot systems in terms of effectiveness, efficiency, goal achievability, and the ability to satisfy users. This paper presents a survey, starting from literature review, chatbot architecture, evaluation methods/criteria, and comparison of evaluation methods. Focused on the three subprocesses in the chatbot architecture: text processing, semantic understanding, and response generation. Moreover, the survey is conducted with classification of chatbot evaluation methods and their analysis according to chatbot types and three main evaluation schemes; content evaluation, user satisfaction, and chat function.

## 2.1 Existing Problem

- AI chatbots can make attending to customers quick and effortless. There is no off day for them and can engage with customers at all times.
- You can get more happy customers when they get prompt replies to their questions.
- Using AI chatbots, you can reap long-term benefits as you don't need to invest in 24x7 customer service teams.
- AI chatbots interact with customers, collect valuable data, and analyze this data. You can systematically collect and use this data to understand your audience and market to them.

## 2.2 Proposed Solution

- ★ These problems have created a need for an alternative, yet effective solution that can handle processes right from the categorising stage, to running a suitable process, to closing the conversation. Chatbot solutions providers must be dedicated towards harnessing the capability of such an enterprise solution, making the customer care experience as simple and cost-effective as possible.
- ★ A chatbot solution provider first has to identify the 'chat-point' where the bot has to be deployed. Second, they have to leverage a method to extract user-intent data and entities contained in the user request. Third, the chatbot has to provide the most appropriate response to the identified request. The answer may include a generic or a predefined text from the knowledge base, data stored in enterprise content management systems or an alternate path re-directing to the main menu.

### 3. THEORITICAL ANALYSIS

#### IBM Watson Assistant:

IBM Watson Assistant is used to build our own branded live chatbot into any device, application, or channel. Chatbot, which is also known as an *assistant*, connects to the customer engagement resources we already use to deliver an engaging, unified problem-solving experience to customers.

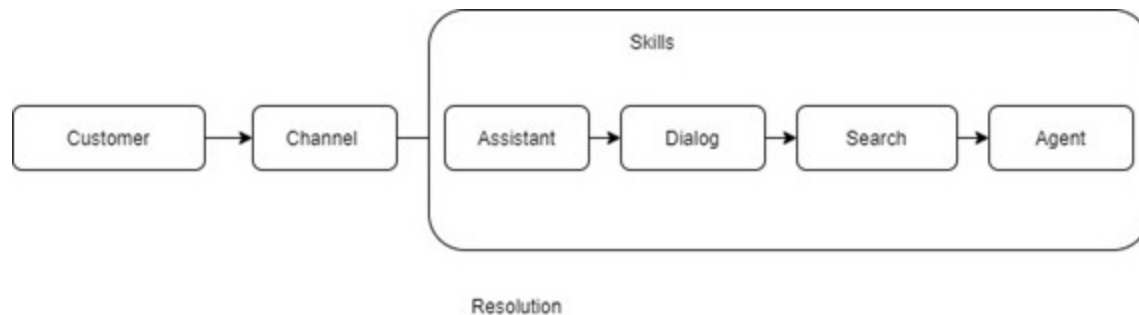


Figure 3.1 Working of IBM Watson Assistant

- **Assistants:** Receives user input and routes it to the dialog skill.
- **Dialog Skill:** The **dialog skill** interprets the user input further, then directs the flow of the conversation. The dialog gathers any information it needs to respond or perform a transaction on the user's behalf.
- **Search:** Any question that cannot be answered by the dialog skill is sent to the **search skill**, which finds relevant answers.
- **Intent:** An *intent* is the user's intention. For example, if a user types "show me yesterday's financial news", the user's intent is to retrieve a list of financial headlines. Intents are given a name, often a verb and a noun, such as "showNews".
- **Entities:** Entities are knowledge repositories used by the bot to provide personalized and accurate responses. Entities can be seen as nouns, often they are referred to as slots. These are usually things like date, time, cities, names, brands etc. Capturing these entities are crucial for taking action based on the user's intent.

### 3.1 Block Diagram

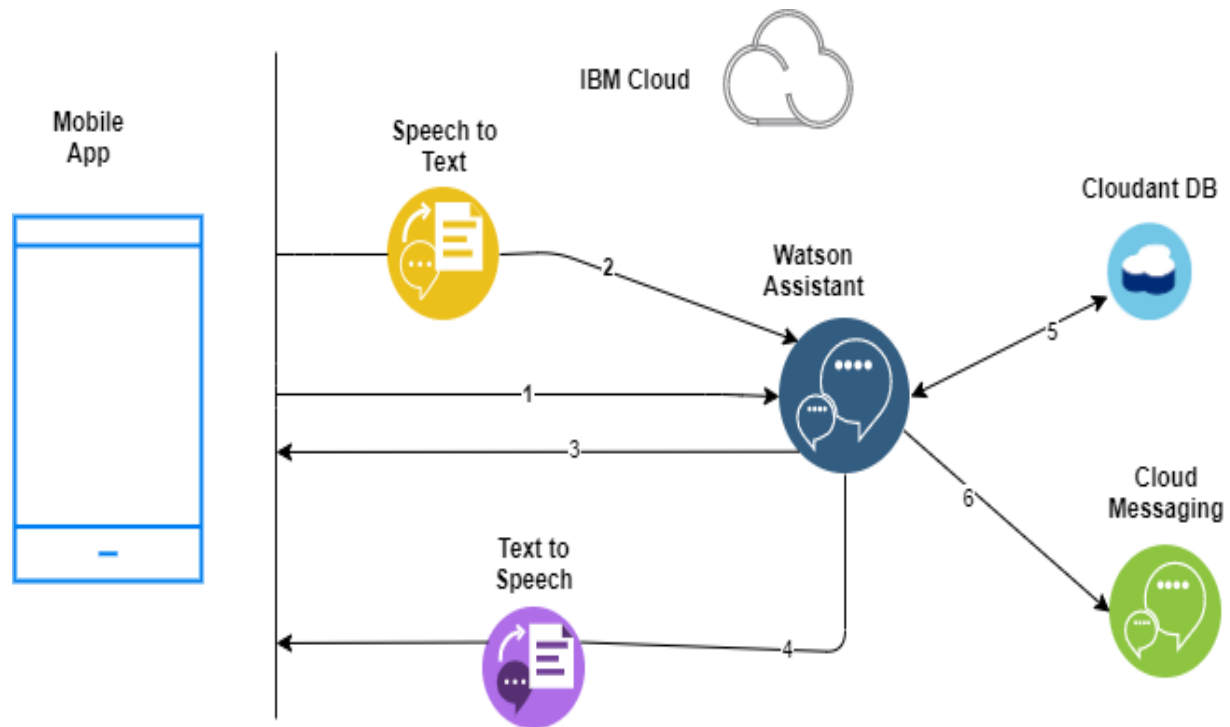


Figure 3.1.1 Block diagram of Restaurant Bot



## **3.2 Hardware/Software requirements**

### **Hardware requirements:**

- CPU : 2.4GHZ
- Hard-disk : 250 GB
- RAM : 4 GB(minimum)

### **Software requirements:**

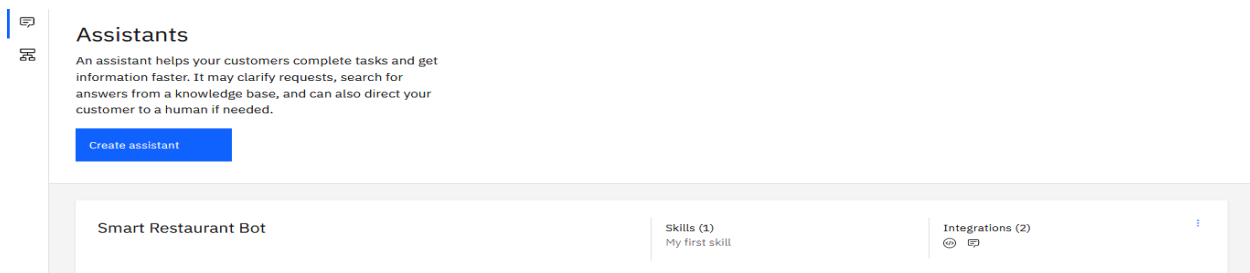
- IBM Cloud
- Watson Assistant

## 4. EXPERIMENTAL INVESTIGATION

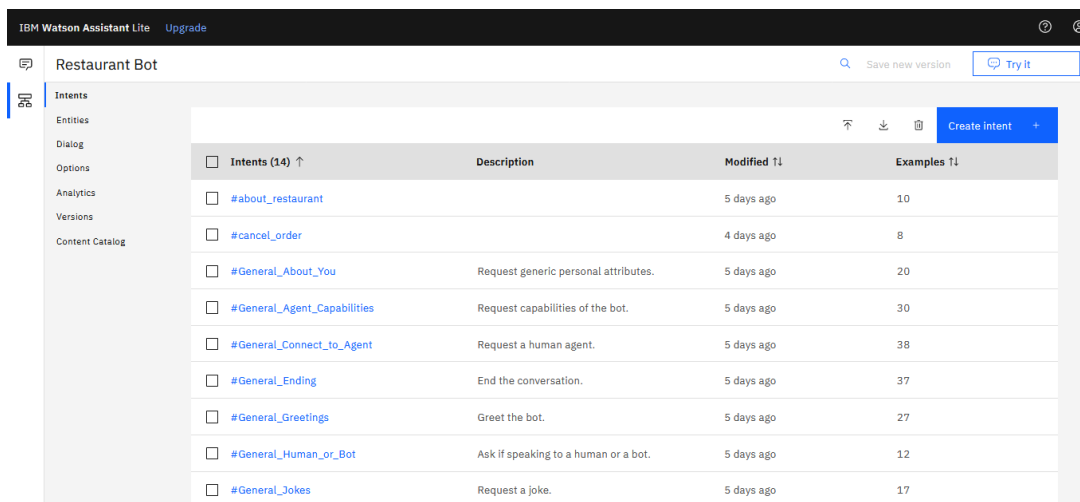
### Step 1 : Open Watson Assistant

Click Launch Watson Assistant.

- A new browser tab or window opens and the Assistants page of Watson Assistant is displayed.
- An assistant named **Smart Restaurant Bot** is created. An assistant is a cognitive bot to which skills are added that enable it to interact with your customers in useful ways.
- A dialog skill named Restaurant Bot is added to the assistant. A dialog skill is a container for the artifacts that define the flow of a conversation that the assistant can have with customers.



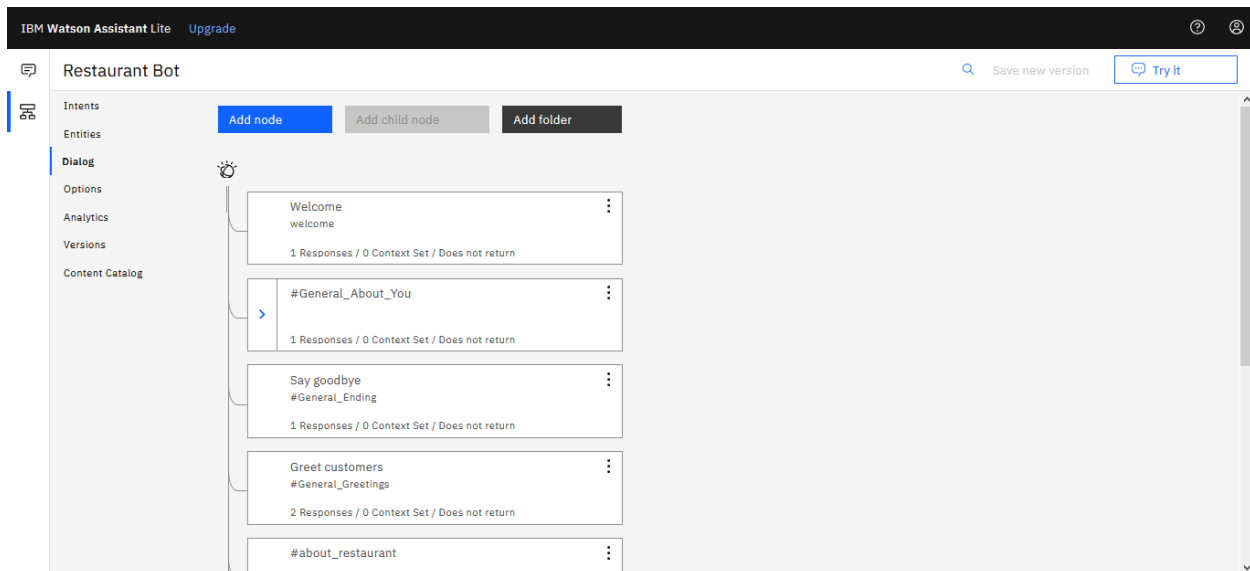
### Step2: Add intents from the content dialog



Intents tab to review the intents and associated example utterances that were added to the training data. Add the intents and corresponding response texts. You can recognize them because each intent name begins with the prefix # add the #greetings and #thanks intents to the dialog in the next step.

### Step 3: Build a dialog

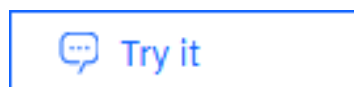
A dialog defines the flow of your conversation in the form of a logic tree. It matches intents (what users say) to responses (what the bot says back). Each node of the tree has a condition that triggers it, based on user input.



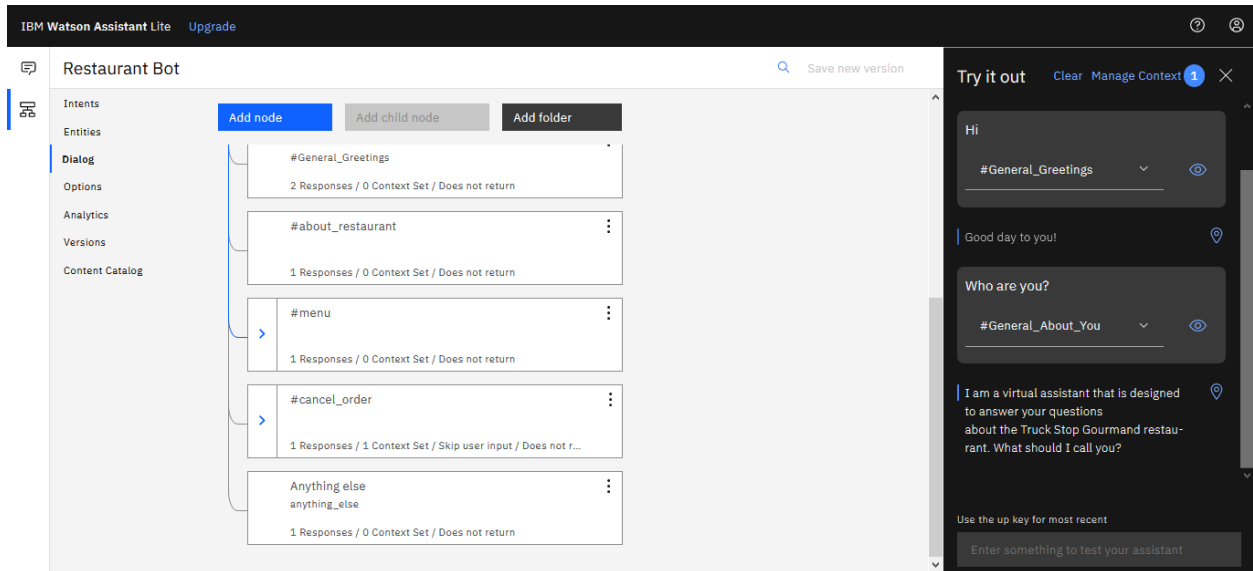
We can click each and every node and change the content in the node. After editing close the window.

### Step 4: Testing the nodes

We can test the nodes by clicking on the try it pane in the top right corner.

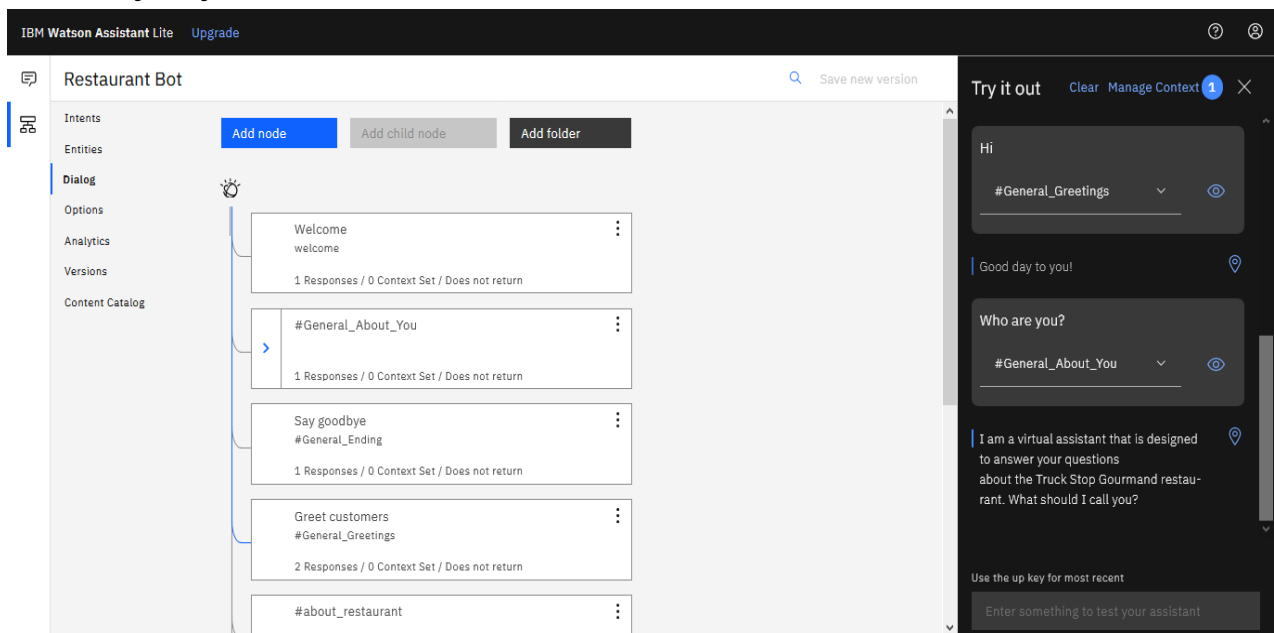


The sample is as follows:



## Step 5: Testing intent recognition

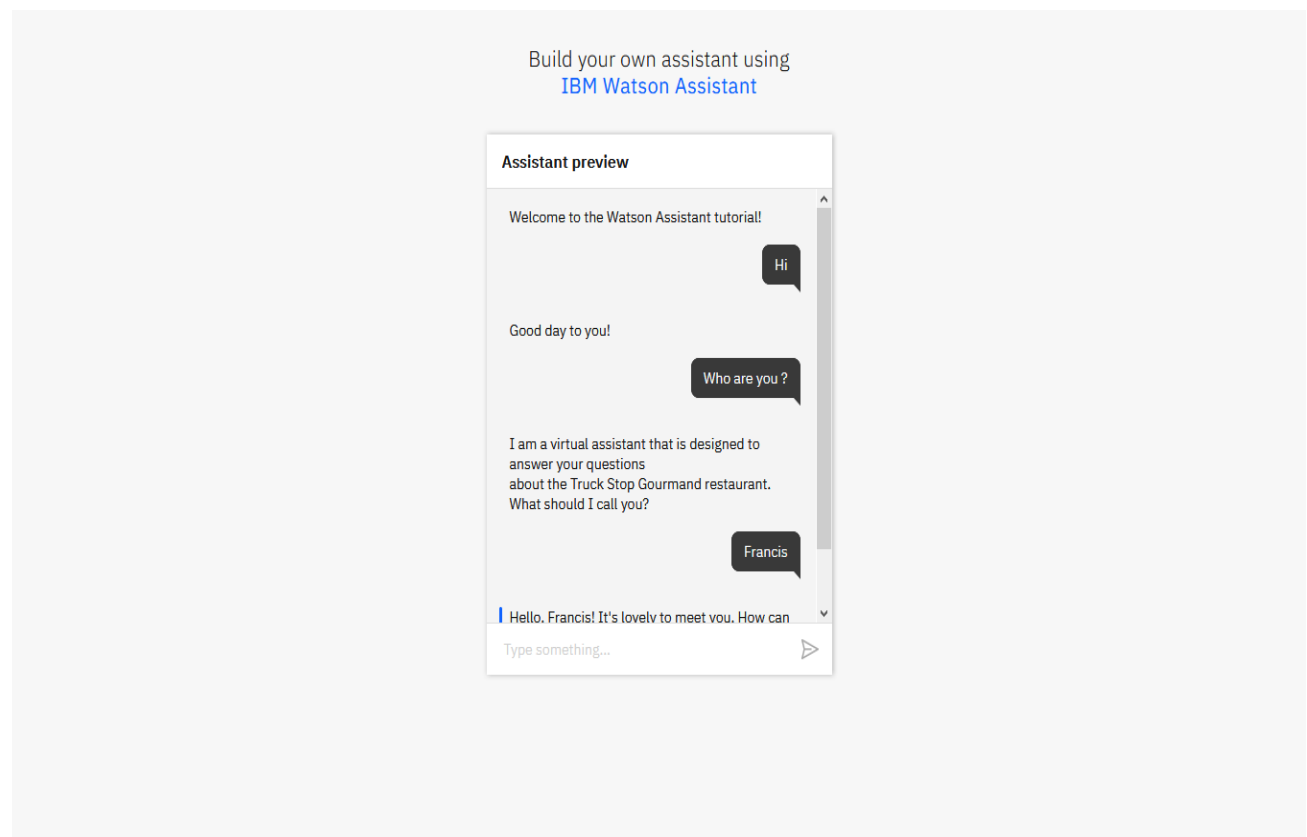
In the text field, type the Hi and then press Enter. The output indicates that the #General\_Greetings intent was recognized and the appropriate text will be Good day to you!



## Step 6: Integrate the assistant

- ⇒ Click the assistants icon, there the list of assistants created will be displayed.
- ⇒ Open smart Restaurant Bot.
- ⇒ Test the assistant with the preview link integration.
- ⇒ If A Smart Restaurant assistant was created, then we must add a preview link integration. From the Integrations area, click Add integration, and then click Preview Link. Click Create.
- ⇒ Click the URL that is displayed in the page.

The sample output will be as follows:



## 5. FLOW CHART

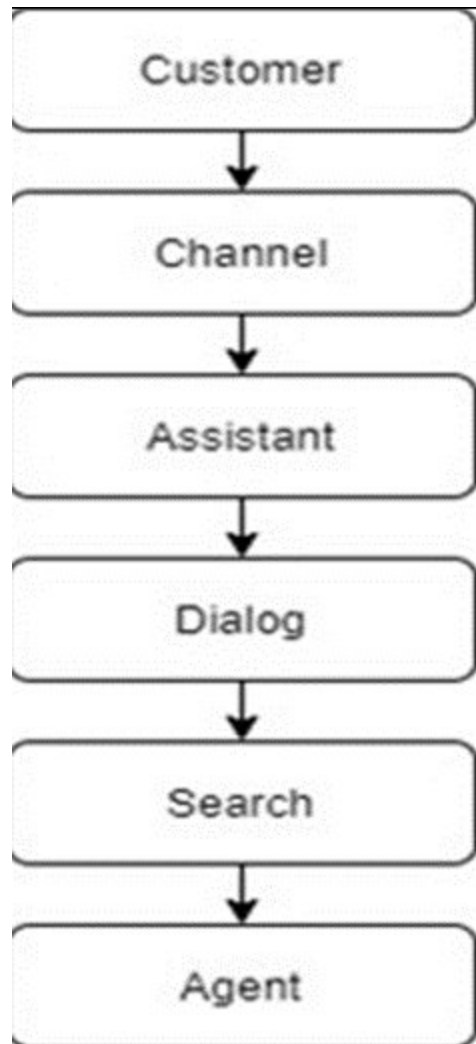
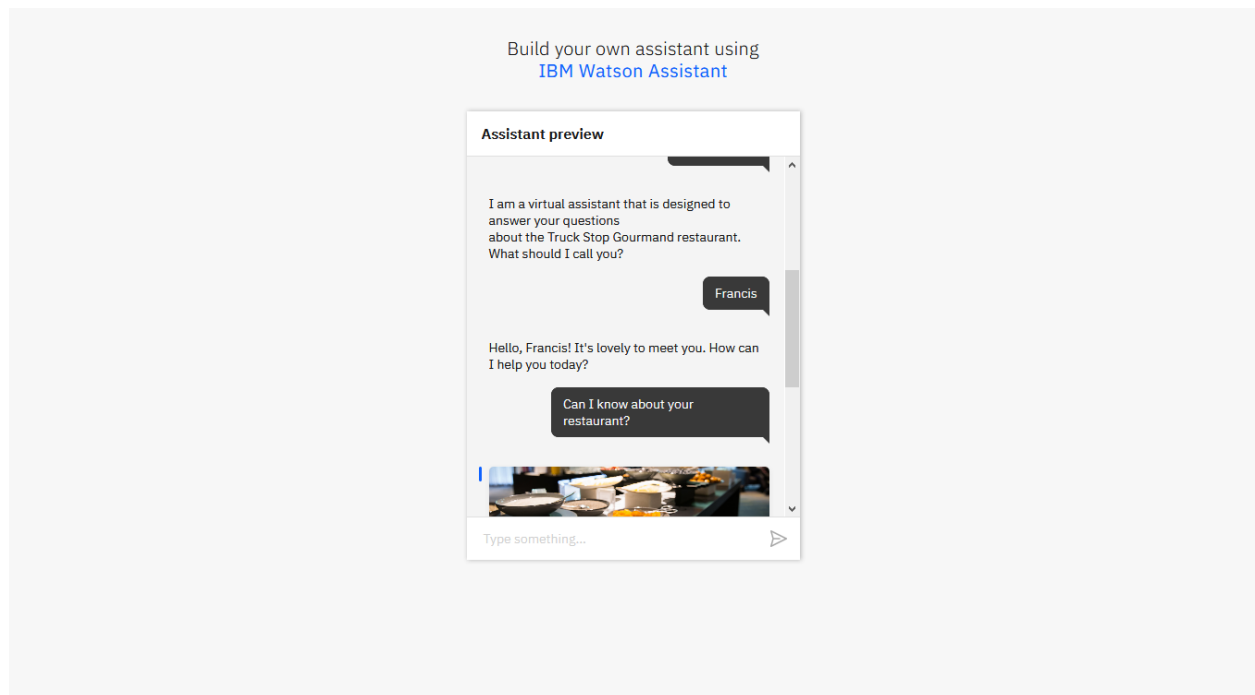
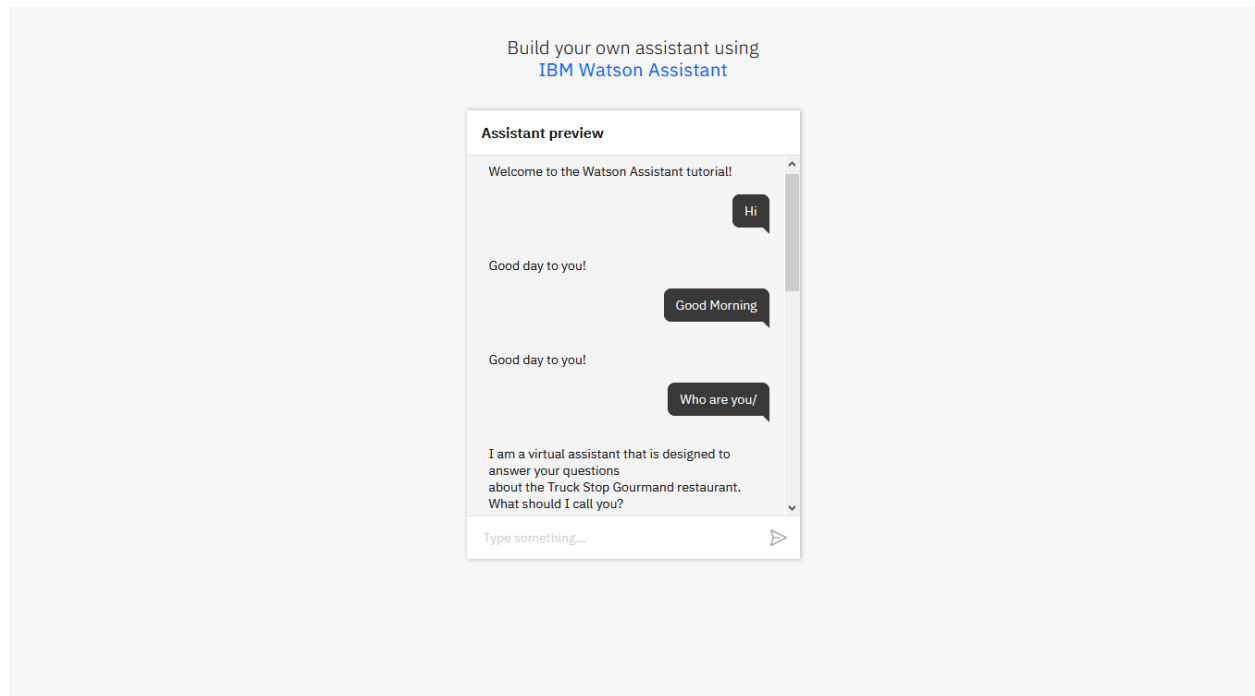
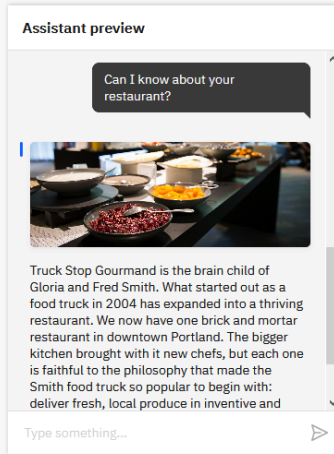


Figure 5.1 Flowchart of Restaurant Bot

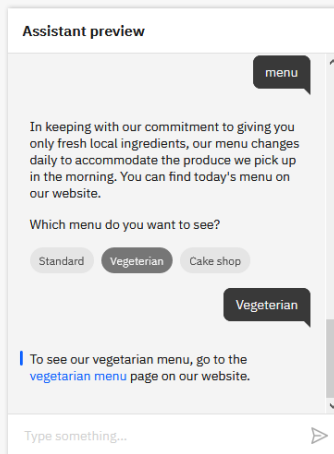
## 6. RESULT



Build your own assistant using  
[IBM Watson Assistant](#)



Build your own assistant using  
[IBM Watson Assistant](#)





Build your own assistant using  
[IBM Watson Assistant](#)

**Assistant preview**

only fresh local ingredients, our menu changes daily to accommodate the produce we pick up in the morning. You can find today's menu on our website.

Which menu do you want to see?

Standard Vegetarian Cake shop

I want to order

can you please order Paneer Butter Masala of 1 plate

Your order for Panner Butter Masala of quantity 1 is ordered successfully

Type something...

Build your own assistant using  
[IBM Watson Assistant](#)

**Assistant preview**

i want to cancel my order

If the pickup time is more than 48 hours from now, you can cancel your order.

What is the order number?

102345

The correct format for our order numbers is AAnnnnn. The A's represents 2 uppercase letters, and the n's represent 5 numbers. Do you have an order number in that format?

TN23456

Type something...

## 7. ADVANTAGES AND DISADVANTAGES

### ★ Advantages

#### Reduced Costs:

Chatbots eliminate the requirement of any manpower during online interaction and are hence seen as a big advantage by companies receiving multiple queries at once. This also presents companies with the opportunity to save on costs while aligning chatbots with their goals and hence presenting customers with a particular type of interaction leading to conversion.

#### 24-7 availability:

Unlike humans, chatbots once installed can attend queries at any time of the day. Thus, the customer doesn't have to wait for the company executive to help them. This also lets companies keep an eye on the traffic during the non-working hours and reach out to them later.

#### Increased Customer Satisfaction:

Another of the pros is that your customers will be more satisfied. When they get satisfactory answers and speedy service, they'll be happier, shop more, and return again.

#### Instant answers:

An operator can concentrate on one customer at a time and answer one question. However, a chatbot can answer thousands of questions at the same time. Thanks to the speed of the cloud, internet, and software mechanisms, responses can be provided instantly.

## ★ Disadvantages

### Limited Responses for Customers:

Although using chatbots may provide faster customer service overall, they aren't perfect. Simple ones may have only limited responses for customers. Therefore, not all customers will get the answers they are searching for.

### Complex Chatbots Could Cost More:

Complex chatbots that solve some of the problems described above can cost more than simple ones. In some cases, these artificial intelligence chatbots cost thousands more. That defeats part of the purpose of a chatbot, which is to save money. Setting up AI is expensive due to the hours of work and testing involved. Sure, they can learn, but it still takes time.

### Inability to Understand:

Due to fixed programs, chatbots can be stuck if an unsaved query is presented in front of them. This can lead to customer dissatisfaction and result in loss. It is also the multiple messaging that can be taxing for users and deteriorate the overall experience on the website.

### Too many functions:

Most of developers strive to create a universal chatbot that will become a fully-fledged assistant to user. But in practice functional bots turn out not to cope with the majority of queries. They often do not understand the user, forget what they were told 5 minutes earlier, and have many other disadvantages.

## 8. APPLICATIONS

### ➤ Find a Restaurant:

Where do you want to eat tonight? Not sure? Ask a chatbot. Much like the product recommendation chatbots, restaurant chatbots can provide recommendations based on cuisine, location, and price range. Some chatbots will even make reservations for you or take your order online.

### ➤ Make reservations:

Using our activation sequences that activate your Facebook fans-people who visited your restaurant once, or never before, and we activate them with special offers and discounts!

### ➤ Get more orders:

Using our engagement sequences, we can reach out to your existing customers and through the sequence, we nurture them and help them order more/easier/faster.

## 9. CONSLUSION

Chatbots have become a necessity in today's age for mobile apps. If a mobile app does not have a chatbot, it should at least have the compatibility of being linked to chatbots. Innovative AI-based chatbots are defining how well an app development company services its businesses and offers apps that are on par with others in the domain. The limits of innovation for chatbots are only defined by how far app developers are willing to go, and this will play a key role in determining the future of mobile apps.

## **10. FUTURE SCOPE**

Artificial intelligence is the hottest talking point for business users looking to improve their efficiency, deliver new ideas and take the next steps in the transition to a digital enterprise. AI and chatbots are helping democratise business, empower startups and help build new partnerships, something that every organisation needs to prepare for.

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## 12. APPENDIX

### Source Code:

```
{
  "name": "node-red-app",
  "version": "1.1.2",
  "dependencies": {
    "node-red-dashboard": "2.x",
    "@cloudant/cloudant": "^4.2.4",
    "bcrypt": "^5.0.0",
    "body-parser": "1.x",
    "ibm-cloud-env": "^0",
    "express": "4.x",
    "http-shutdown": "1.2.2",
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    "node-red-node-cf-cloudant": "0.x",
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    "node-red-contrib-ibm-db2": "0.x"
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    "start": "node --max-old-space-size=160 index.js --settings
./bluemix-settings.js -v"
  },
  "engines": {
    "node": "12.x"
  }
}
```

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