
**Don Bosco Institute of Technology**
**Kurla, Mumbai, 400070**

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**Department of Computer Engineering**

**Subject: Cloud Computing Laboratory**

**Mini Project Report**

# Title of Report : COVID – 19 AUTO CHAT

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# Problem Definition

In times of crisis, communications systems are often overwhelmed with people trying to find basic information about testing, symptoms, community response, and other resources. When communication lines get clogged, people who need real help can't get through. Chatbots help respond to tens, even hundreds, of thousands of messages a day.

## How can technology help ?

Whether via text, phone, websites, or communication apps, conversing with chatbots and other AI-enabled resources can play a critical role in helping communities quickly understand crucial information and free up customer service resources to focus on higher-level issues.

IBM Watson Assistant service helps you build, train, and deploy conversational interactions into any application, device, or channel. Creating a chatbot using Watson Assistant can help address the issues that our users face while trying to gather accurate, relevant information. Whether you're trying to learn the latest news about Covid-19 or learn where there's testing in your area, a chatbot can play a major role in helping communities quickly understand crucial information and free up customer service resources to focus on higher-level issues.

# INTRODUCTION

COVID-19 has citizens looking for answers about symptoms and testing sites as well as current status of schools, transportation, and other public services. Using Watson Assistant, this Call for Code Starter Kit has designed a virtual assistant pre-loaded to understand and respond to common questions about COVID-19, scan COVID-19 news articles using Watson Discovery and respond to COVID statistics inquires with data from trusted sources.

With this Watson Assistant powered Crisis Communications Starter Kit you can integrate a chatbot into your Call for Code solution in an IBM Cloud hosted web server, using a Slack integration or via a Node-RED Dashboard.

It can:

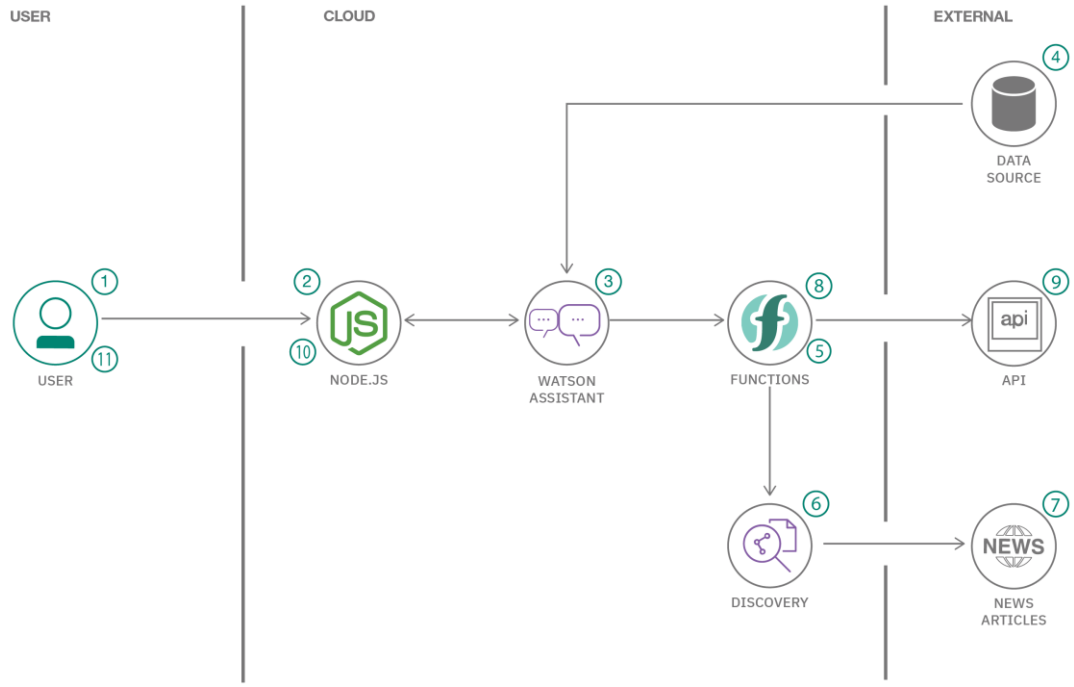
- Respond by sharing consistent, accurate COVID-19 information
- Help citizens quickly and easily access the latest information through their channel of choice – voice, text or collaborative tool
- Free valuable resources by automating answers to common COVID-19 questions
- Dynamically update information with the latest developments and recommendations

The challenge for you is to build out from this framework to create a more complete solution.

# How it works

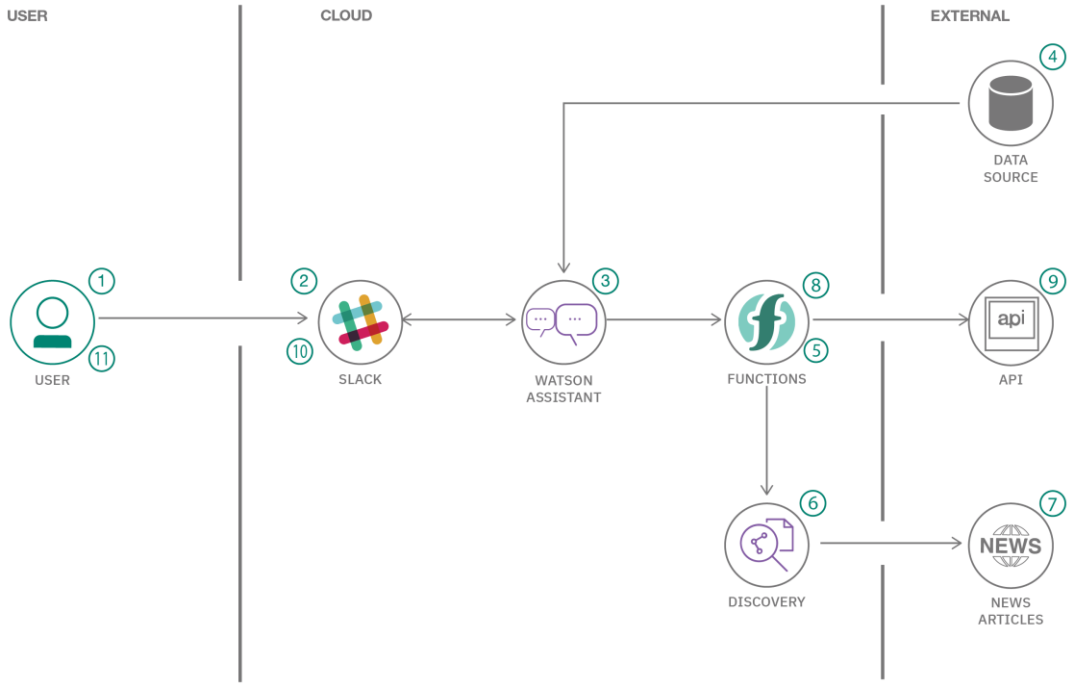
Diagrams

## Website integration with COVID-19 crisis communication chatbot



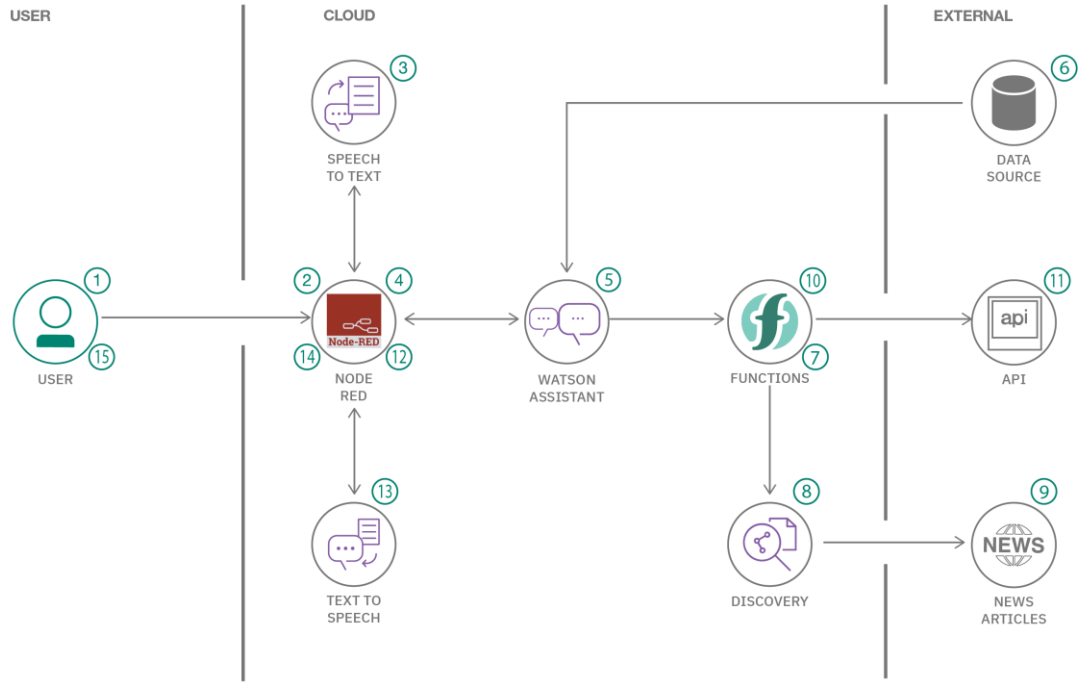

1. User visits a website with the COVID-19 chatbot and asks a question.
2. Node.js web server calls the Watson Assistant service hosted in IBM Cloud.
3. Watson Assistant uses natural language understanding and machine learning to extract entities and intents of the user question.
4. Source COVID-19 FAQ information from trusted CDC data.
5. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
6. IBM Cloud Function calls the Watson Discovery service running in IBM Cloud.
7. Watson Discovery scans news articles and responds with relevant articles.
8. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
9. IBM Cloud Function calls the COVID-19 API to get statistics.
10. Watson Assistant replies to the user inquiry.
11. Node.js web server displays the chat answer to the user.

## Slack integration with COVID-19 crisis communication chatbot




1. User invokes a COVID-19 Slack integration chatbot app and asks a question.
2. Slack app calls the Watson Assistant service hosted in IBM Cloud.
3. Watson Assistant uses natural language understanding and machine learning to extract entities and intents of the user question.
4. Source COVID-19 FAQ information from trusted CDC data
5. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
6. IBM Cloud Function calls the Watson Discovery service running in IBM Cloud.
7. Watson Discovery scans news articles and responds with relevant articles.
8. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
9. IBM Cloud Function calls the COVID-19 API to get statistics.
10. Watson Assistant replies to the Slack application.
11. Slack app displays the chat answer to the user.

# Voice enabled COVID-19 crisis communication chatbot using Node-RED




1. User visits a voice-enabled Node-RED website with the COVID-19 chatbot and asks a question.
2. Node-RED records the speech wav file and calls the Watson Speech to Text service hosted in IBM Cloud.
3. Watson Speech to Text uses machine learning to decode the user's speech.
4. Watson Speech to Text replies with a transcript of the COVID-19 question and Node-RED calls Watson Assistant service hosted in IBM Cloud.
5. Watson Assistant uses natural language understanding and machine learning to extract entities and intents of the user's question.
6. Source COVID-19 FAQ information from trusted CDC data
7. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
8. IBM Cloud Function calls the Watson Discovery service running in IBM Cloud.
9. Watson Discovery scans news articles and responds with relevant articles.
10. Watson Assistant invokes an OpenWhisk open source powered IBM Cloud Function.
11. IBM Cloud Function calls the COVID-19 API to get statistics.
12. Watson Assistant replies to the user inquiry and Node-RED sends the text transcript to Watson Text to Speech.
13. Watson Text to Speech encodes the message in the user's language.

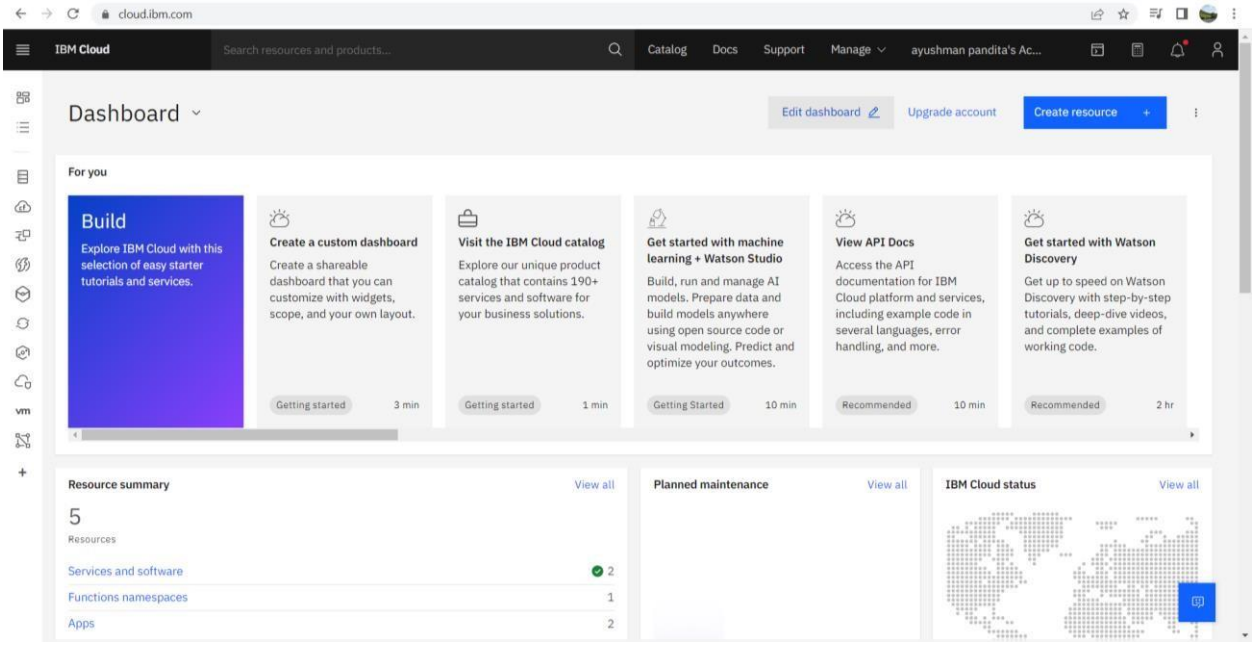
# IMPLEMENTTION

- Register for an IBM Cloud account.

## Set up an instance of Watson Assistant

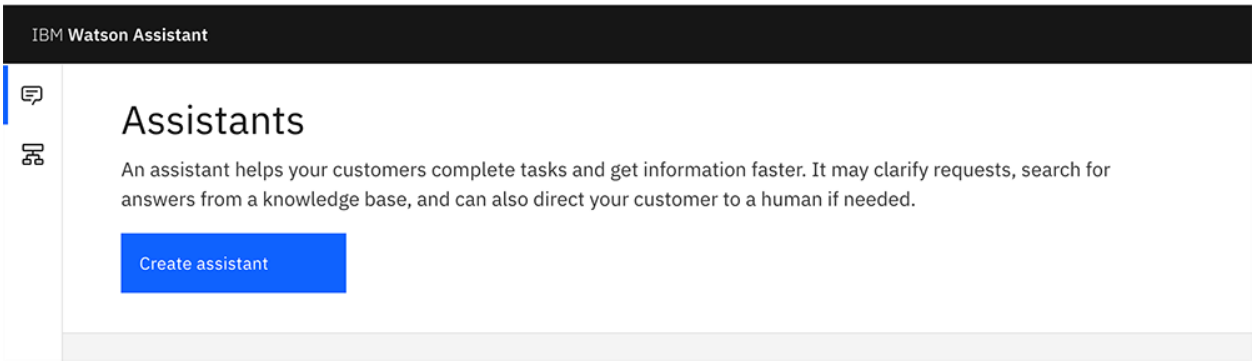
Log in to IBM Cloud and provision a Watson Assistant instance.

**Step 1.** From the IBM Cloud catalog, provision an an instance of **Watson Assistant**.

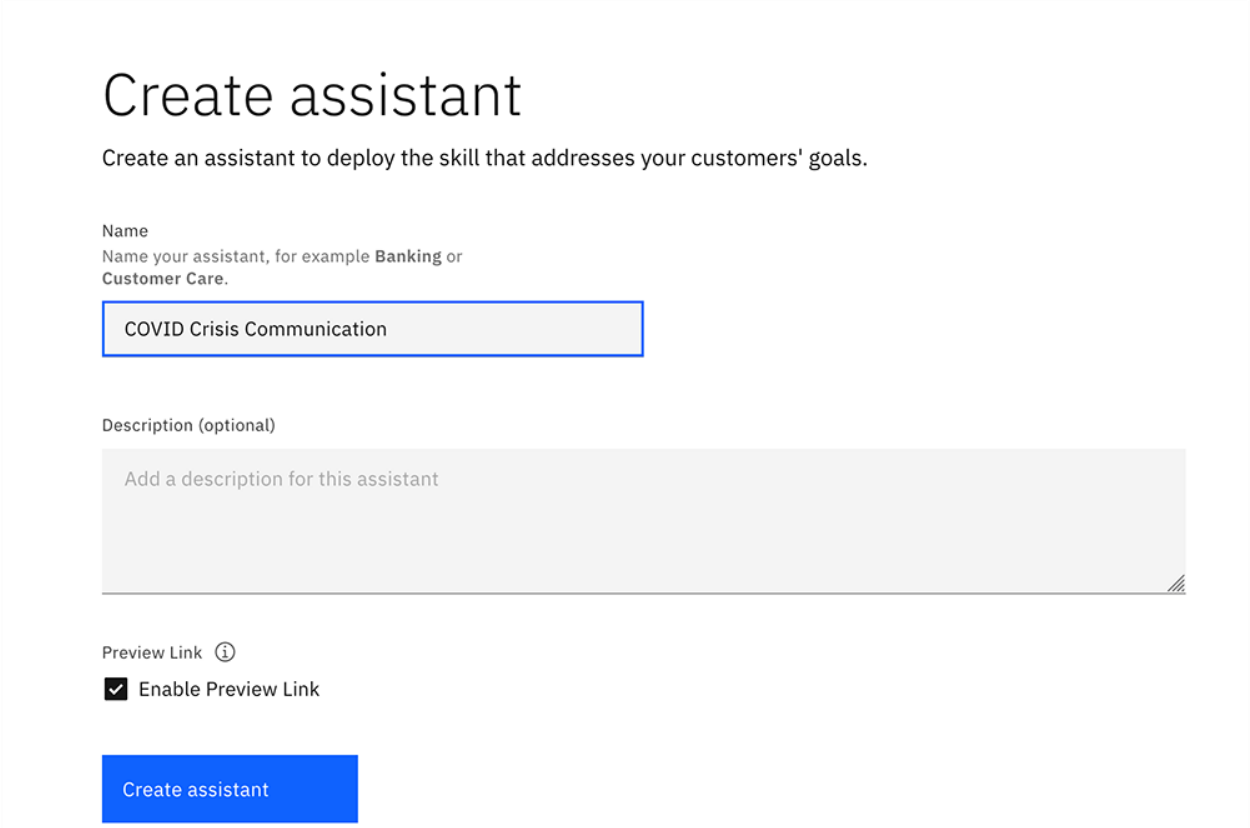



**.** Launch the Watson Assistant service.

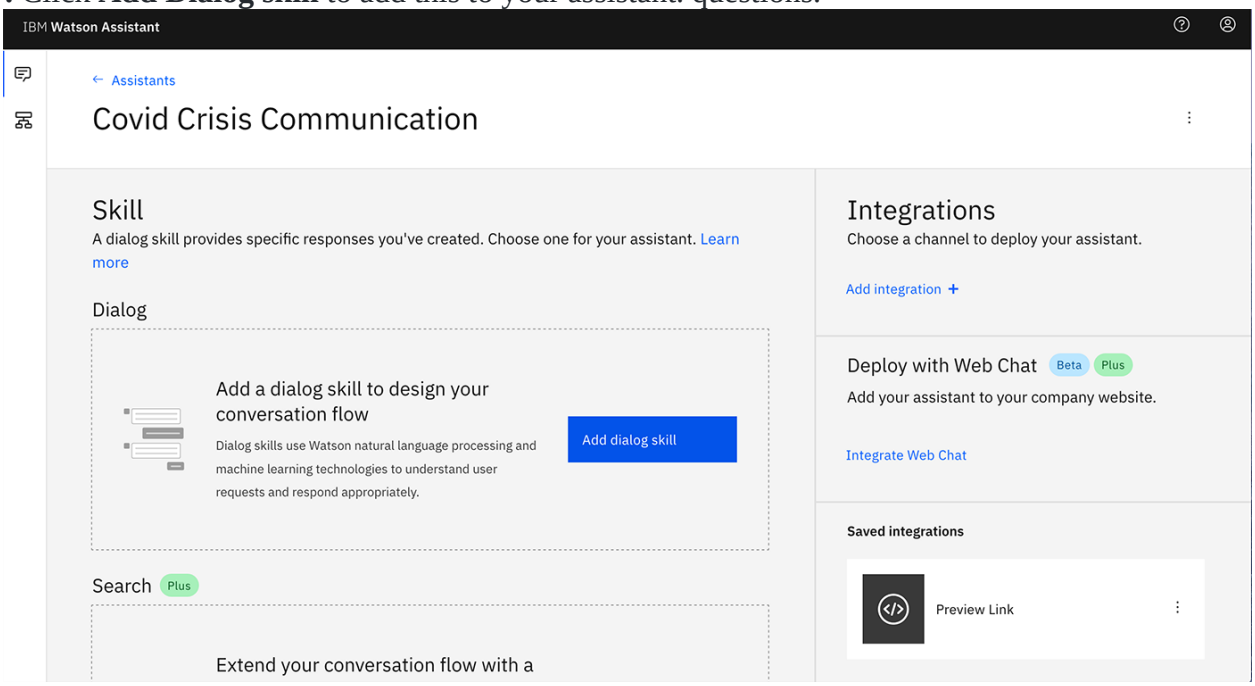
assistant.



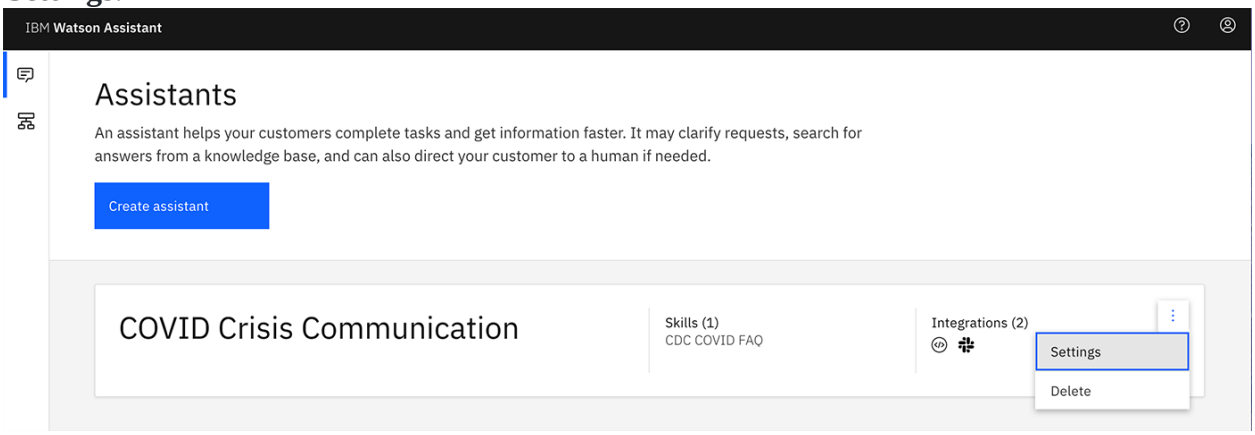

**.** Name the Watson Assistant instance **COVID Crisis Communication**




. Click **Add Dialog skill** to add this to your assistant. questions.

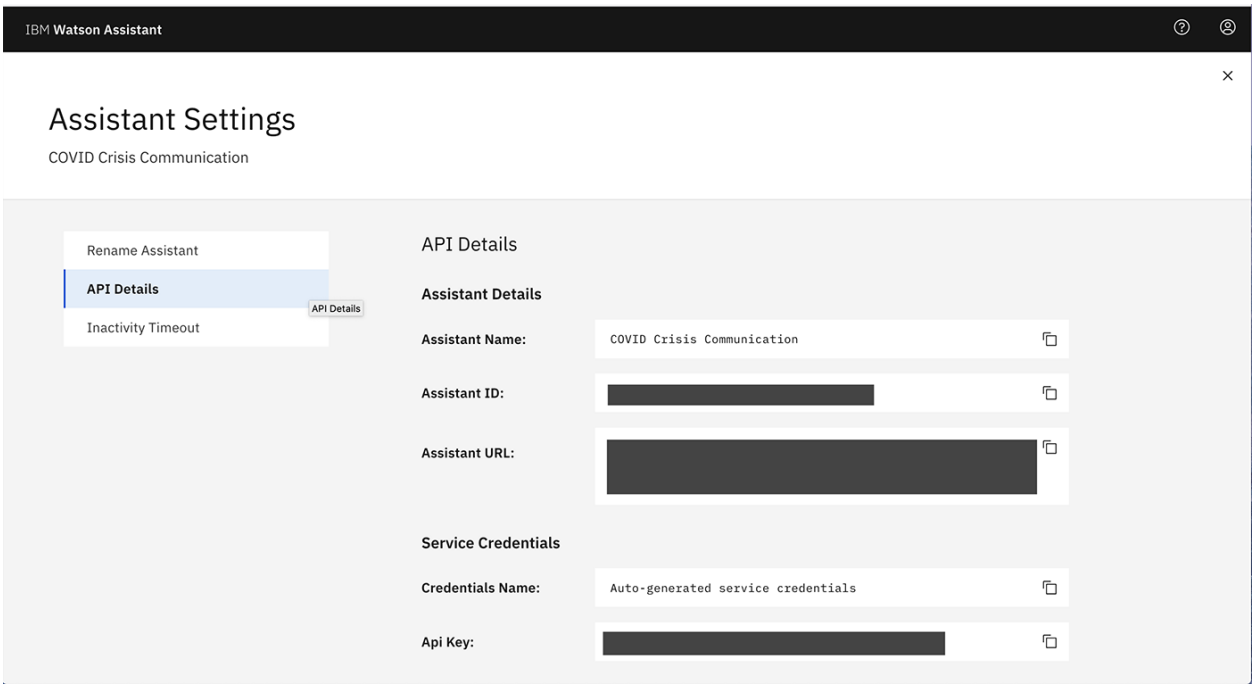


. Go back to the All Assistants page. From the action menu ( ⋮ ), open **Settings**.

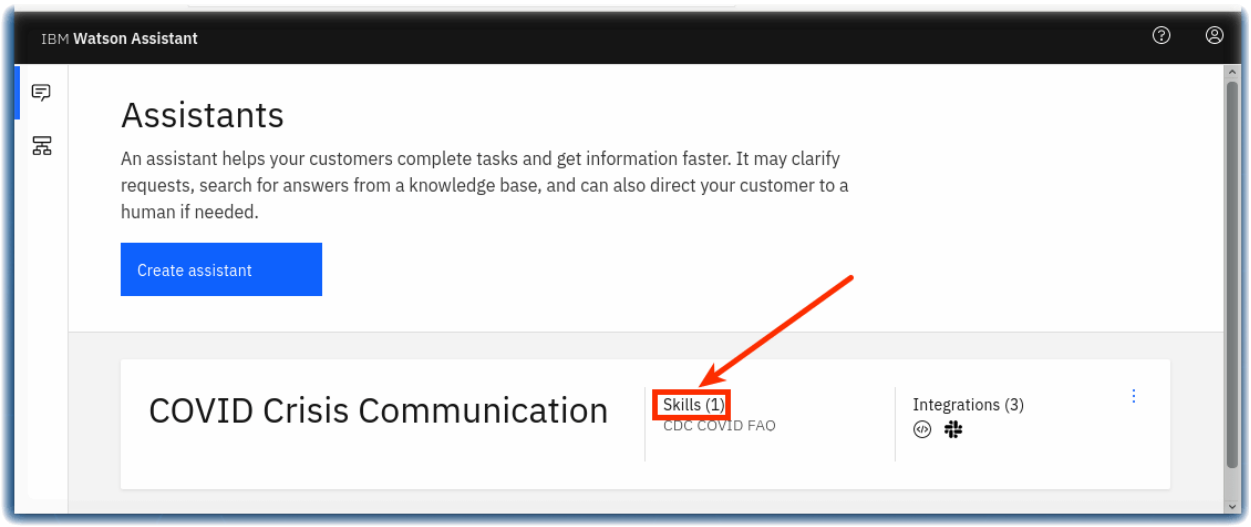



. On the Settings tab, click **API Details** on the left and make a note of the Assistant ID and Api Key for future

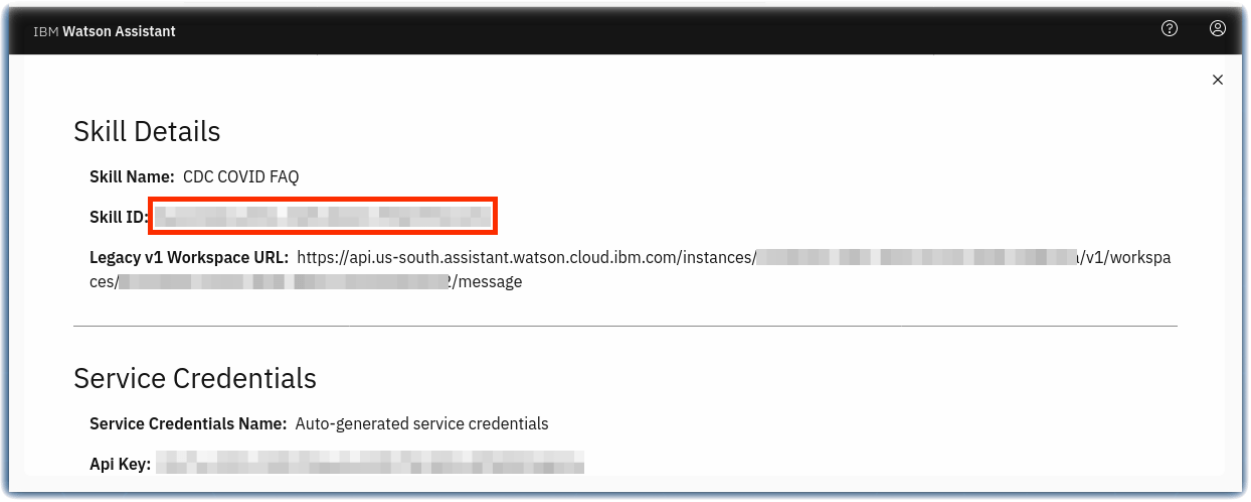
use.



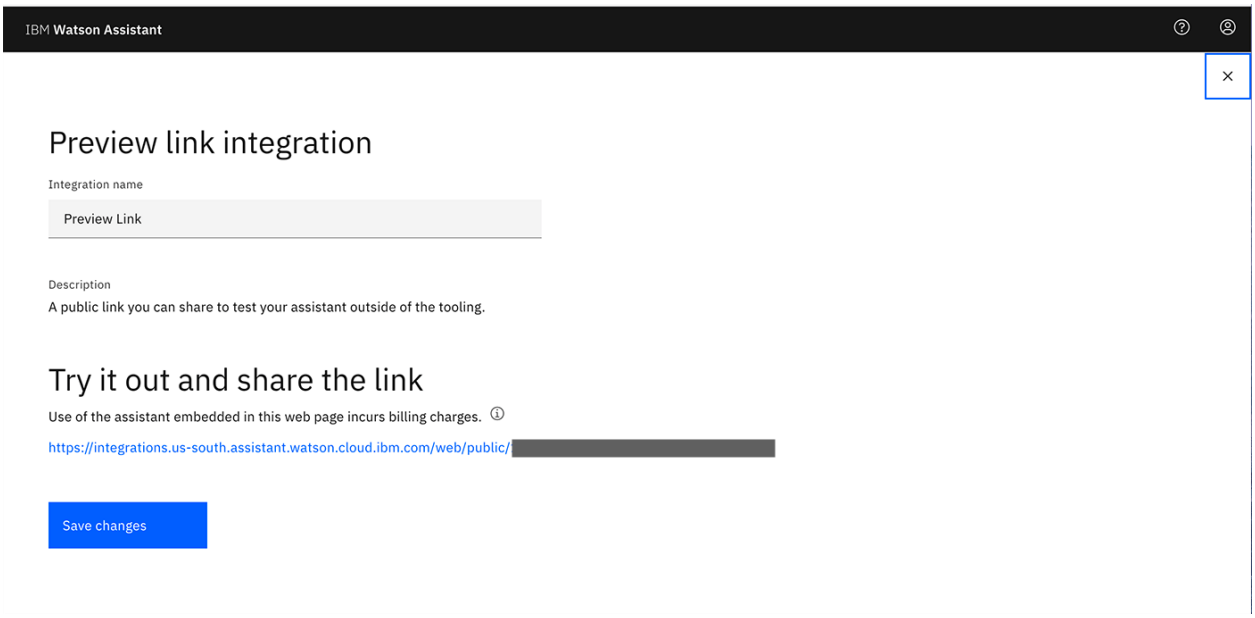

.Go back to the All Assistants page and click on the **Skills** link.




. On the Skill Details page, make note of the Skill ID for future use.




. Go back to your dialog skill and click on the **Preview Link** button on the side to get a link to test and verify your assistant.




. Ask the Watson Assistant chatbot some questions about COVID-19.

## Connect your chatbot to data sources via a webhook

Now that you've created your Watson Assistant-enabled chatbot, you need to connect it to a data source. With Watson Assistant, you need to do this via a webhook.

A webhook is a mechanism that allows you to call out to an external program based on something happening in your program. When used in a dialog skill, a webhook is triggered when the assistant processes a node that has a webhook enabled. The webhook collects data that you specify or that you collect from the user during the conversation and save in context variables. It sends the data as part of a HTTP POST request to the URL that you specify as part of your webhook definition. The URL that receives the webhook is the listener. It performs a predefined action using the information that you pass to it as specified in the webhook definition, and can optionally return a response

# LEARNING OUTCOME:

This tool is intended to provide information based on currently available CDC and other public information to help you make decisions about seeking appropriate medical care. This system is not intended for the diagnosis or treatment of disease or other conditions, including COVID-19, and you should not provide any personally identifying or private health information.

This Watson Assistant bot is populated with data that is sourced from the following resources:

- Most static responses provide information found on the CDC's COVID FAQ Page: https://www.cdc.gov/coronavirus/2019-ncov/faq.html
- Dynamic infection and death counts are sourced from Johns Hopkins University via the following API: https://www.covid19api.com/
- Dynamic news stories are sourced from Watson Discovery's news feed. Additional information on that service can be found here: https://www.ibm.com/watson/services/discovery-news/