

HOW TO BUILD AN IBM WATSON ASSISTANT CHAT BOT

*Using the Socratic Questioning Method, the 4 Key
Questions and Bloom's Taxonomy*

MY BACKGROUND

- Teacher of Languages | Founder of Girls&BoysinTech and The Language School | CRM Manager | Analyst | Python, NLP & ML and AI enthusiast | GCP, Oracle & IBM Cloud | Mentor @DataEthics4All & @Hackmakers
- Github [sammyj-w \(SammyJ\)](https://github.com/sammyj-w) (github.com)
- LinkedIn [linkedin.com/in/2020sw](https://www.linkedin.com/in/2020sw)
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OBJECTIVES

- Gain a basic understanding of Watson Assistant.
 - Understand the development steps.
 - Apply design thinking for a cognitive solution.
 - Create an instance of Watson Assistant
 - Define intent and dialogs to help natural language processing.
 - Build a simple Dialogue flow
 - Translate into another language
-
- A quick overview of Dialogflow from GCP

CHAT BOTS CAN BE DEPLOYED ON E.G.

- WORDPRESS
- SLACK
- FACEBOOK CHAT
- EMBEDDED INTO OTHER WEBSITES

KEY QUESTIONS FOR BUILDING 'SOCRATIC DIALOGUE'

- The 4 Key Questions from my school St Gregory the Great
- Socratic Model of Dialectic Questioning
- Blooms Taxonomy of questioning
- From research carried in the classroom
- Curious children

SOCRATIC MODEL OF DIALECTIC QUESTIONING - THEORY

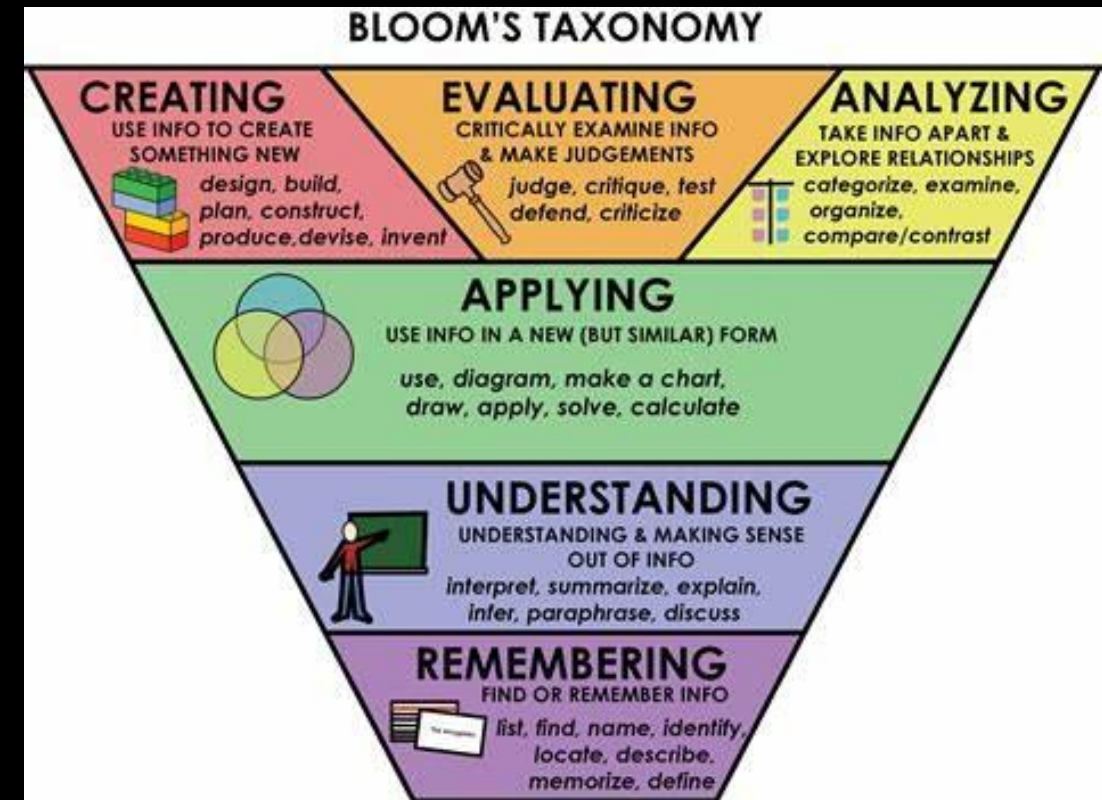
- Socrates famously took to the streets of Athens to reason with and question his fellow citizens.
- He is associated with the method called 'Elenchus-refutation', and conducted his activities by means of questions and answer.
- Plato referred to him as a Midwife, who had no ideas of his own but gave birth to them in others.
- He used a dialectic techniques like asking citizens questions, or practicing collection and division, or proceeding from hypotheses.
- Cross examining a particular position or definition by testing and refuting the speaker.

- Aristotle says Socrates' great contribution was his focus upon definitions and reasoning.
- He looked for definitions of terms like justice, virtue, love, piety.
He often started with a statement like 'This generous action is virtuous', hoping to establish a more important generalization such as 'all generous actions are virtuous'.
- An example of the Socratic dialectic method would be asking the interlocutor to explain what it means to be 'pious'.
- He would not accept an example of piety, but a clear definition, often leading to the realisation that the individual did not know the meaning of the term, only after further probing in the dialogue was an exact definition provided.
- Socrates showed the importance of his dialectic method here and the necessity of defining key terms in decision making.

BLOOMS TAXONOMY

Competence	Skills Demonstrated	Question Cues:
Knowledge	<ul style="list-style-type: none"> observation and recall of information knowledge of dates, events, places knowledge of major ideas mastery of subject matter 	list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension (understanding)	<ul style="list-style-type: none"> understanding information grasp meaning translate knowledge into new context interpret facts, compare, contrast order, group, infer causes predict consequences 	summarise, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
Application	<ul style="list-style-type: none"> use information use methods, concepts, theories in new situations solve problems using required skills or knowledge 	apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
Analysis	<ul style="list-style-type: none"> seeing patterns organisation of parts recognition of hidden meanings identification of components 	analyse, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer
Synthesis	<ul style="list-style-type: none"> use old ideas to create new ones generalise from given facts relate knowledge from several areas predict, draw conclusions 	combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalise, re-write
Evaluation	<ul style="list-style-type: none"> compare and discriminate between ideas assess value of theories, presentations make choices based on reasoned argument verify value of evidence recognise subjectivity 	assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarise

Adapted from: Bloom, B.S. (Ed.) (1956) Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain. New York ; Toronto: Longmans, Green.





Learning at St Gregory The Great



Every lesson, every day, follow our 4 key questions:

1. What are we going to be learning?
2. How have we been shown the new learning?
3. What activities are we going to complete to show we understand the learning?
4. How will we demonstrate we have learnt it?

Your teachers promise to:-

*Know your abilities, talents and differences well.
Teach great lessons so you can perform to the best of your ability,
Be ambitious and care for you.*

CASE STUDY

- A teacher wants to modernize the way that the students and the teacher approach questions to their tasks in and outside the classroom. Currently, hundreds of questions are posed and not automated or follow a logical structure to help resolve the a key question or problem statement. Half of the questions are answered at the end of lesson, or take time to elicit, others may not be resolved in the classroom. Those situations result in frustration and a loss of learning time and understanding for the students and teachers.
- In this tutorial, you implement a simple Socratic Questioning Dialogflow using IBM Watson chatbot. The chatbot streamlines Classroom questions by automating the dialog flow and quickening up the process.

STEP 1

- SIGN UP FOR AN IBM WATSON TRIAL [Sign up for a trial.](#)

STEP 2. CREATE THE ASSISTANT

- Click **Catalog** and then click **Services > Watson > Assistant**.
- **Launch Watson Assistant.** If you're prompted to log in, provide your IBM Cloud credentials.
- A new browser tab or window opens and Watson Assistant is displayed.

- An assistant named **My first assistant** is created for you automatically. An *assistant* is a Chabot. You add skills to your assistant so it can interact with your customers in useful ways.
- A dialog skill named **My first skill** is added to the assistant for you automatically. A *dialog skill* is a container for the artefacts that define the flow of conversations that your assistant has with your customers.
- The dialog skill is opened and the *Intents* page is displayed.



My first skill

[Save new version](#)[Try it](#)

Intents

[Entities](#)[Dialog](#)[Options](#)[Analytics](#)[Versions](#)[Content Catalog](#)

What is an intent?

An intent is a collection of user statements that have the same meaning. By creating intents, you train your assistant to understand the variety of ways users express a goal. [Learn more](#)

You will find some pre-made intents in the content catalog. [Browse content catalog](#)

[Create intent](#)[Import intents](#)

STEP 3. ADD INTENTS FROM A CONTENT CATALOG

- The Intents page is where you start to train your assistant. In this tutorial, you will add training data that has been built already to your skill.
- Prebuilt intents are available from the content catalog. You will give your assistant access to the **General** content catalog so your dialog can greet users, and end conversations with them.
- Click **Content Catalog** from the Skills menu.
- Find **General** in the list, and then click **Add to skill**.



My first skill

[Save new version](#)[Try it](#)[Intents](#)[Entities](#)[Dialog](#)[Options](#)[Analytics](#)[Versions](#)[Content Catalog](#)

Get started faster by adding existing intents from the content catalog. These intents are trained on questions that customers commonly ask.

Category	Description	Intents	
Banking	Basic transactions for a banking use case.	13	Add to skill +
Bot Control	Functions that allow navigation within a conversation.	9	Add to skill +
Covid-19	Common questions about the Covid-19 virus.	23	Add to skill +
Customer Care	Understand and assist customers with information about themselves and your business.	18	Add to skill +
eCommerce	Payment, billing, and basic management tasks for orders.	14	Add to skill +
General	General conversation topics most users ask.	10	Add to skill +
Insurance	Issues related to insurance policies and claims.	12	Add to skill +

- Open the Intents tab to review the intents and associated example utterances that were added to your training data.
- You can recognize them because each intent name begins with the prefix #General_. You will add the **#General_Greetings** and **#General_Ending** intents to your dialog in the next step.

IBM Watson Assistant Lite Upgrade

My first skill

Intents

Entities

Dialog

Options

Analytics

Versions

Content Catalog

Save new version

Try it

Create intent +

Intents (10) ↑	Description	Examples ↑↓
<input type="checkbox"/> #General_About_You	Request generic personal attrib...	20
<input type="checkbox"/> #General_Agent_Capabilities	Request capabilities of the bot.	30
<input type="checkbox"/> #General_Connect_to_Agent	Request a human agent.	38
<input type="checkbox"/> #General_Ending	End the conversation.	37
<input type="checkbox"/> #General_Greetings	Greet the bot.	27
<input type="checkbox"/> #General_Human_or_Bot	Ask if speaking to a human or a ...	12
<input type="checkbox"/> #General_Jokes	Request a joke.	17
<input type="checkbox"/> #General_Negative_Feedback	Express unfavorable feedback.	20
<input type="checkbox"/> #General_Positive_Feedback	Express positive sentiment or g...	19
<input type="checkbox"/> #General_Security_Assurance	Express concerns about the sec...	26

- You have successfully started to build your training data by adding prebuilt content from IBM.

THE SOCRATIC QUESTIONING INTENTS MODEL

- I have pre-built my own Content of Intentions called 'Socratic Questioning' which only I will see
- I am now going to show you how I did this

ANY QUESTIONS AT THIS POINT?

STEP 4: 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 your virtual assistant says back).
- Each node of the tree has a condition that triggers it, based on user input.
- We'll create a simple dialog that handles greeting and ending intents, each with a single node.

ADDING A START NODE

- From the Skills menu, click **Dialog**.
- The following two dialog nodes are created for you automatically:
- **Welcome**: Contains a greeting that is displayed to your users when they first engage with the assistant.
- **Anything else**: Contains phrases that are used to reply to users when their input is not recognized.



My first skill



Save new version



Try it



Intents

Entities

Dialog

Options

Analytics

Versions

Content Catalog

Add node

Add child node

Add folder



Welcome
welcome



1 Responses / 0 Context Set / Does not return



Anything else
anything_else



1 Responses / 0 Context Set / Does not return


- Click the **Welcome** node to open it in the edit view.
- Replace the default response with the text, Welcome to the Watson Assistant tutorial!.


Welcome

Customize  


Node name will be shown to customers for disambiguation so use something descriptive. [Settings](#)





If assistant recognizes


welcome 




Assistant responds


Text 

Welcome to the Watson Assistant tutorial!



Enter response variation



Response variations are set to **sequential**. Set to [random](#) | [multiline](#)

[Learn more](#)

- Click X to close the edit view.
- You created a dialog node that is triggered by the welcome condition. (welcome is a special condition that functions like an intent, but does not begin with a #.)
- It is triggered when a new conversation starts. Your node specifies that when a new conversation starts, the system should respond with the welcome message that you add to the response section of this first node.

TESTING THE START NODE





Click the Try it icon to open the "Try it out" pane. You should see your welcome message.


It is located on the top right of the webpage.

STEP 5. ADDING NODES TO HANDLE INTENTS

- Now let's add nodes between the Welcome node and the Anything else node that handle our intents.
 1. Click Add node.
 2. In the node name field, type Greet customers.
 3. In the If assistant recognizes field of this node, start to type #General_Greetings. Then, select the #General_Greetings option.
 4. Add the response text, Good day to you!

 My first skill

 Save new version Try it



- Intents
- Entities
- Dialog**
- Options
- Analytics
- Versions
- Content Catalog

Add node

Add child node

Welcome
welcome
1 Responses / 0 Context Set / Does not r

**Greet customers
#General_Greetings
1 Responses / 0 Context Set / Does not r**

Anything else
anything_else
1 Responses / 0 Context Set / Does not r

Greet customers

Node name will be shown to customers for disambiguation so use something descriptive.

Settings

If assistant recognizes

#General_Greetings +

Assistant responds

Text

Good day to you!

Enter response variation

Response variations are set to sequential. Set to random | multiline

5. Click Close to close the edit view.
6. Click Add node to create a peer node.
7. Name the peer node Say goodbye and specify #General_Ending in the If assistant recognizes field.
8. Add OK. See you later. as the response text.

e

Add child node

Add

Welcome

welcome

1 Responses / 0 Context Set / Does not return

Greet customers

#General_Greetings

1 Responses / 0 Context Set / Does not return

Say goodbye

#General_Ending

1 Responses / 0 Context Set / Does not return

Anything else

Say goodbye

Node name will be shown to customers for disambiguation so use something descriptive.

Settings

If assistant recognizes

#General_Ending

+

Assistant responds

Text

OK. See you later.



My first skill



Intents

Entities

Dialog

Options

Analytics

Versions

Content Catalog

Add node

Add child node

Add folder



Welcome

welcome



1 Responses / 0 Context Set / Does not return

Greet customers

#General_Greetings



1 Responses / 0 Context Set / Does not return

Say goodbye

#General_Ending



1 Responses / 0 Context Set / Does not return

Anything else

anything_else



1 Responses / 0 Context Set / Does not return

- 9. Click Close to close the edit view.

STEP 6. TESTING INTENT RECOGNITION

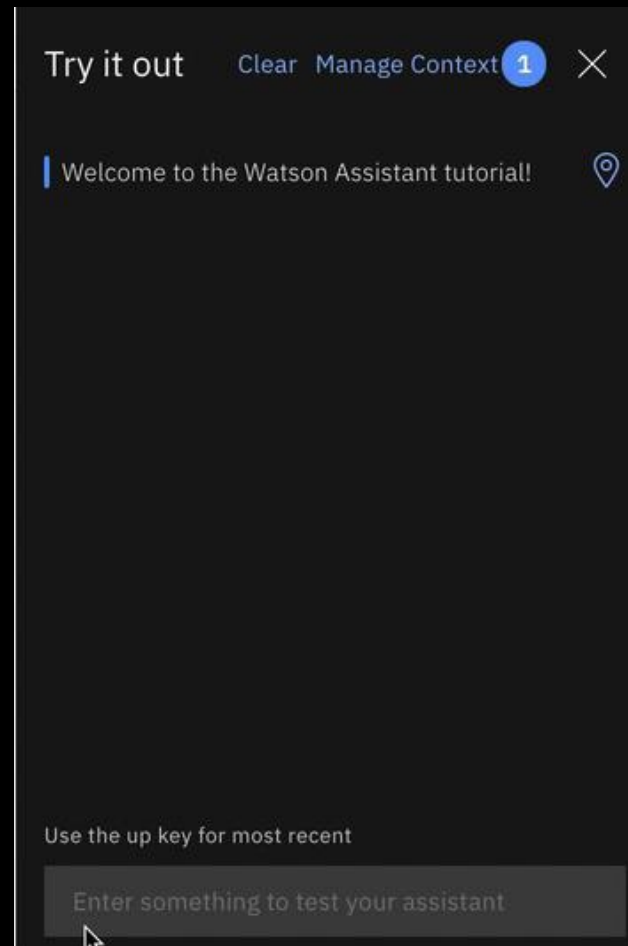
- You built a simple dialog to recognize and respond to both greeting and ending inputs. Let's see how well it works.

1. Click the Try it icon to open the "Try it out" pane. There's that reassuring welcome message.
2. In the text field, type Hello and then press Enter. The output indicates that the **#General_Greetings** intent was recognized, and the appropriate response (Good day to you.) is displayed.
3. Try the following input:
 - bye
 - howdy
 - see ya
 - good morning
 - sayonara

- 4. Watson can recognize your intents even when your input doesn't exactly match the examples that you included. The dialog uses intents to identify the purpose of the user's input regardless of the precise wording used, and then responds in the way you specify.

RESULT OF BUILDING A DIALOG

- That's it. You created a simple conversation with two intents and a dialog to recognize them.



Video demo of the example we built

STEP 7: INTEGRATE THE ASSISTANT

- Now that you have an assistant that can participate in a simple conversational exchange, test it.
1. Click the Assistants icon Assistants menu icon to open a list of your assistants.
 2. Find the My first assistant, and open it.
 3. Test your assistant with a Preview link integration.
 4. The Preview link integration is created for your automatically. It builds your assistant into a chat widget that is hosted by an IBM-branded web page. You can open the web page and chat with your assistant to test it out.
 5. From the Integrations section, click the Preview link tile.



[← Assistants](#)

My first assistant

Built for you to explore and learn.



Skill

A dialog skill provides specific responses you've created.

Choose one for your assistant. [Learn more](#)

Dialog

My first skill



LANGUAGE:
English (US)

TRAINED DATA:
10 Intents | 0 Entities | 4 Dialog nodes

VERSION:

DESCRIPTION:

VERSION CREATED:

LINKED ASSISTANTS (1): My first assistant

Search Plus

Turn any content into answers

- Create Q&A experience **in minutes**
- Sync with websites and data sources for **always up-to-date** answers

Try Plus plan

Integrations

Choose a channel to deploy your assistant.

[Add integration +](#)

Saved integrations



Preview link

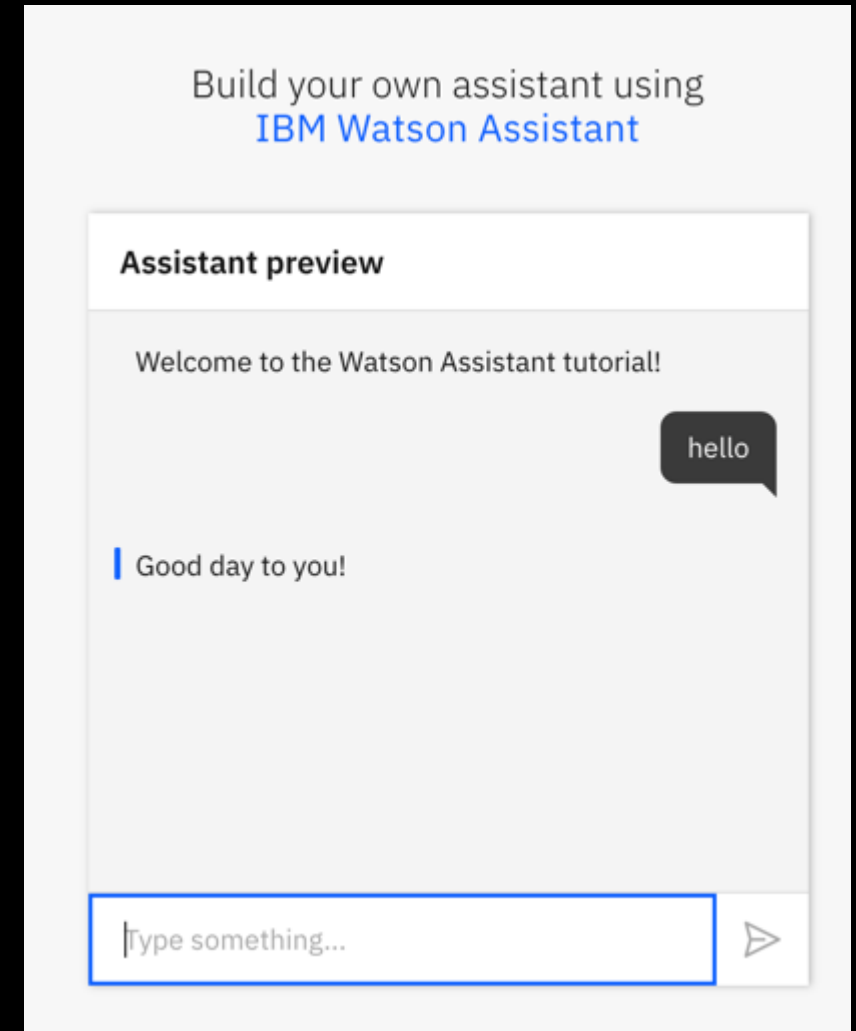


Web chat



IBM WATSON ASSISTANT³⁹

- 6. Click the URL that is displayed on the page.
- The test web page opens in a new tab. You can start submitting message to see how your assistant responds.
- 7. Type hello into the text field, and watch your assistant respond.



- You can share the URL with others who might want to try out your assistant.
- 8. After testing, close the web page. Click the X to close the preview link integration page.

- **Next steps**
- This tutorial is built around a simple example.
- For a real application, you need to define some more interesting intents, some entities, and a more complex dialog that uses them both. When you have a polished version of the assistant, you can integrate it with web sites or channels, such as Slack, that your customers already use. As traffic increases between the assistant and your customers, you can use the tools that are provided in the Analytics page to analyze real conversations, and identify areas for improvement.

SLACK INTEGRATION

- NB: YOU MUST REQUEST PERMISSION FROM SLACK CHANNEL ADMIN TO GAIN ACCESS TO YOUR CHATBOT

IBM Watson Assistant Lite [Upgrade](#)



Slack integration

Integration name

Step 1

Set up your Slack bot

[Create a Slack app](#) if you don't have one already. If you already have an app, go to the [Your Apps](#) page on the Slack website. Click the app you want to use.

• Slack | Manage Apps | Cloud Services @ IBM

Step 2

Connect Watson Assistant to Slack

1. On the Slack app settings page, go to the **Basic Information** tab and find the **App Credentials** section. Copy your verification token from that section to the field below.

Verification token

6MbkofkNPzs42IkfMMLRritC

2. Go to the **OAuth & Permissions** tab. In the **Bot Token Scopes** section click **Add an OAuth Scope**, and then select the following scopes:

- app_mentions:read
- chat:write
- im:history
- im:read
- im:write

3. On the **OAuth & Permissions** tab. Click **Install App to Workspace**, and then click **Allow**. You should be redirected back to the OAuth & Permissions page. Copy and paste your Bot User OAuth access token to the following field.

Bot user OAuth access token


xoxb-152207191189-1272656768770-9BywmHUQh9MAzoJYNh8HGB

Step 3

Configure your Slack bot

1. On the Slack app settings page, go to the **Event Subscriptions** tab. Switch the **Enable Events** toggle to the **On** position. In the provided text entry field, paste your request URL.

Generated request URL

`https://integrations.eu-gb.assistant.watson.cloud.ibm.com/public/slack/message/8a9490f5-fbc0-430d-8000-000000000000` 

2. On the **Event Subscriptions** tab, find the **Subscribe to Bot Events** section. Click **Add Bot User Event**, and then select the event types you want to subscribe to. You must select at least one of the following types:
 - **message.im**: Listens for message events that are posted in a direct message channel.
 - **app_mention**: Listens for only message events that mention your app or bot.
3. Click **Save Changes**.

Step 4

Connect your assistant

1. On the **App Home** tab. Click **Edit** and enter a display name and default username for your virtual assistant and then click **Save**. Enable the **Always Show My Bot as Online** toggle.
2. **Optional**: To add support for showing buttons, menus, and disambiguation options in the Slack app, go to the **Interactivity & Shortcuts** tab and enable the feature. Paste your request URL in the provided text entry field, and then click **Save Changes**.

CONNECTING TO FACEBOOK

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- You can integrate your Chat Bot to Facebook by choosing the Facebook option in the Integrations section.
- 1. click on the 'Add Integrations' button under the Integrations section in My First Assistant, and connect up your Facebook account.

IBM Watson Assistant Lite Upgrade

← Assistants

My first assistant

Built for you to explore and learn.

Actions Beta

Build conversations easier than ever

- Have an assistant ready to chat in less time, with less effort
- Compose step-by-step flows for any range of simple or complex conversations
- Focus more on your customer's goals and experience
- Collaborate and work more intuitively, made so that anybody can build

[Learn more](#)

[Add an actions skill](#)

Dialog

My first skill

LANGUAGE:	TRAINED DATA:	VERSION:	DESCRIPTION:	VERSION CREATED:
English (US)	54 Intents 5 Entities 42 Dialog nodes	---	---	---

LINKED ASSISTANTS (2): My first assistant, [Socratic Questioning for Students](#)

Integrations

Slack

Web chat

Choose a channel to deploy your assistant. [Add integration](#)

12/6/2020

INTEGRATING IT ONTO YOUR WEBSITE

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- You can embed the code to your website for the Chat Bot once it is completed.
- 1. Click on the 'Web chat' Integration icon to test and build the code into your website, located under the Integrations list in My First Assistant.

The screenshot displays the IBM Watson Assistant Lite web interface. The top navigation bar includes 'IBM Watson Assistant Lite' and an 'Upgrade' link. The main content area is titled 'My first assistant' with the subtitle 'Built for you to explore and learn.' Below this, there are two main sections: 'Actions' and 'Integrations'. The 'Actions' section, marked as 'Beta', contains a list of bullet points about building conversations and a 'Learn more' link. The 'Integrations' section on the right lists 'Slack' and 'Web chat'. The 'Web chat' integration is circled in red, and a red arrow points to it from the 'Add an actions skill' button in the 'Actions' section. Below the 'Integrations' list, there is a prompt to 'Choose a channel to deploy your assistant' with an 'Add integration' link. At the bottom, a table shows the details of 'My first skill', including language, trained data, version, and description.

IBM Watson Assistant Lite Upgrade

← Assistants

My first assistant

Built for you to explore and learn.

Actions Beta

Build conversations easier than ever

- Have an assistant ready to chat in less time, with less effort
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Dialog

My first skill

LANGUAGE:	TRAINED DATA:	VERSION:	DESCRIPTION:	VERSION CREATED:
English (US)	54 Intents 5 Entities 42 Dialog nodes		---	

LINKED ASSISTANTS (2): My first assistant, [Socratic Questioning for Students](#)

Integrations

- Slack
- Web chat**

Choose a channel to deploy your assistant. [Add integration](#)

12/5/2020

- 2. Here you can modify the style, home screen and embed your chatbot, if you cannot resolve a query you can also connect the webchat feature to a live agent.

IBM Watson Assistant Lite [Upgrade](#)

Web chat

Close

Saved

Integration name

Web chat

Style


Home Screen

Live agent

Suggestions

Security

Embed

 Customize your chat UI

Update the style to match your brand and your website. A developer can also add more advanced styling changes with code. [Learn more](#)

Assistant's name as known by customers

Watson Assistant

Primary color

Chat header

#FFFFFF


Secondary color

User message bubble

#3D3D3D

Accent color

Significant and interactive objects



Add an avatar image [🔗](#)

Restart conversation [↺](#)

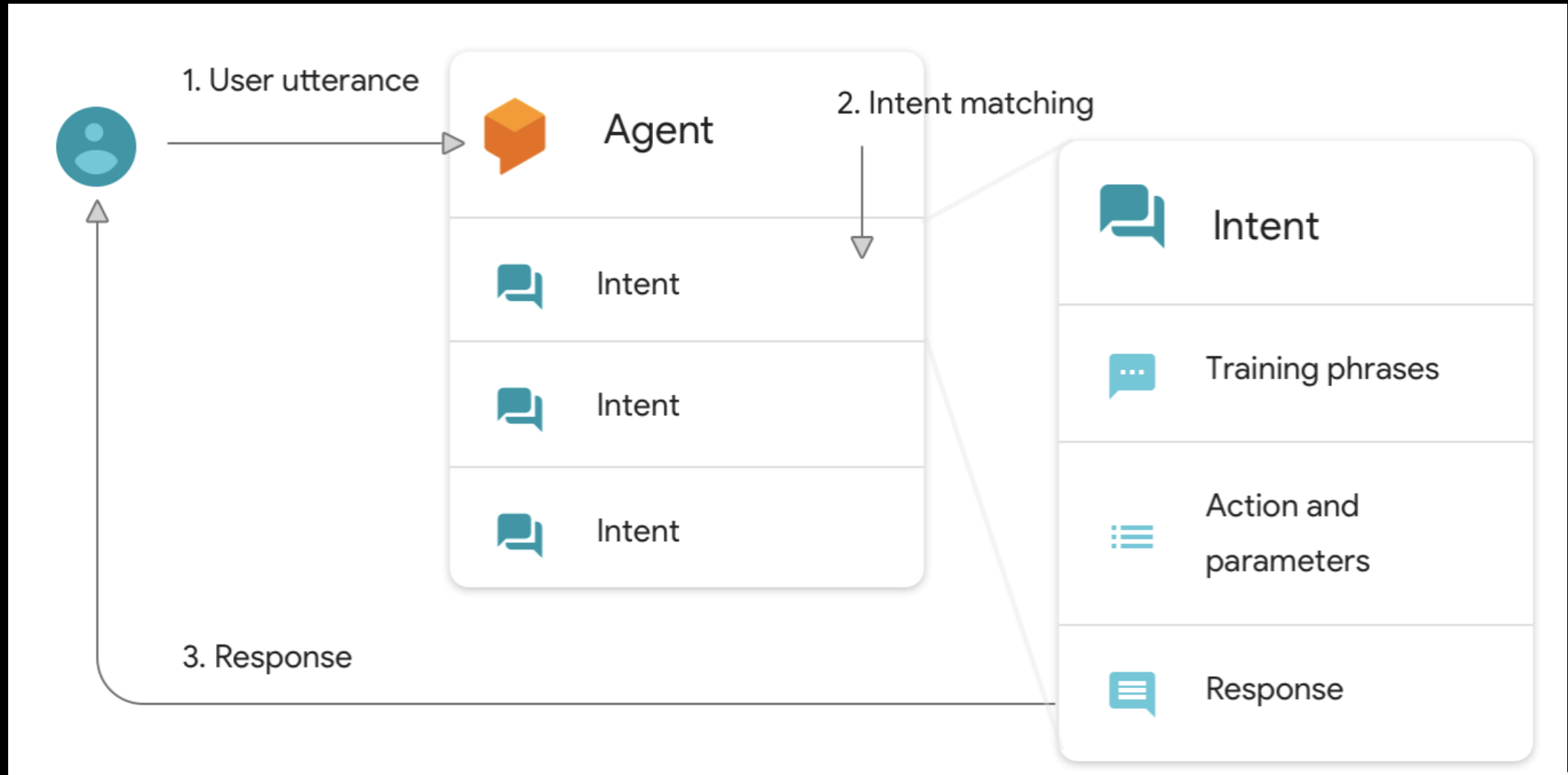
Watson Assistant

ALTERNATIVE CHATBOT TOOLS

- GCP's DialogFlow is available as an API in the Google Cloud Console API Library.
- [Dialogflow API – APIs & Services – My Project 7734 – Google Cloud Platform](#)



DIALOG FLOW MODEL FROM GCP



REFERENCES

- Getting started with Watson Assistant (ibm.com)
- <https://cloud.ibm.com/docs/assistant?topic=assistant-getting-started>
- “A Socratic Model of dialectic questioning” (Babalola A., 2020)

THANK YOU FOR ATTENDING THIS BOOTCAMP

- Do you have any further questions?

- Github [sammyj-w \(SammyJ\) \(github.com\)](https://github.com/sammyj-w)
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