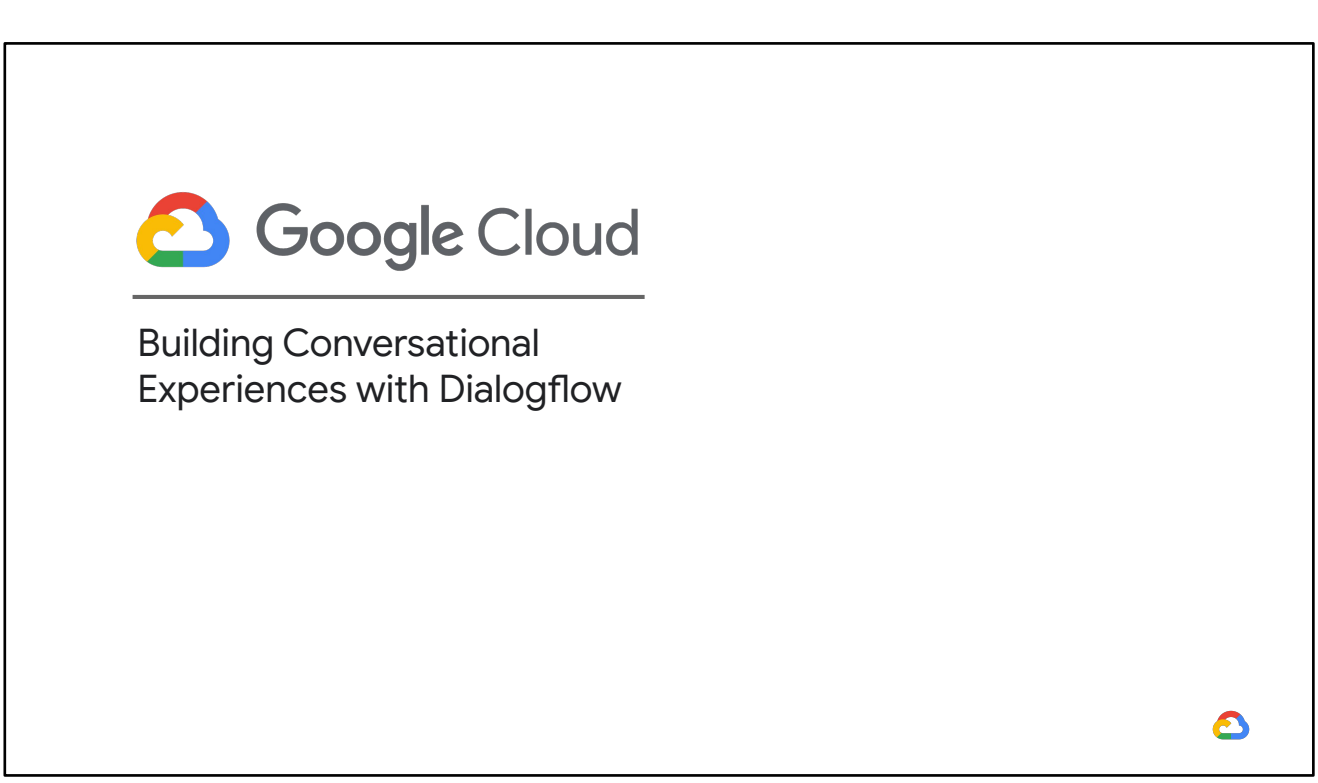


Welcome to the first module of the Building Conversational Experiences with Dialogflow course.

Agenda

What is a Conversational Experience?

Chatbot Journey and Challenges

Build Engaging Conversational Interfaces with Dialogflow

Life of a Conversation

Your Chatbot Workflow

Let’s start by discussing what a conversational experience is.

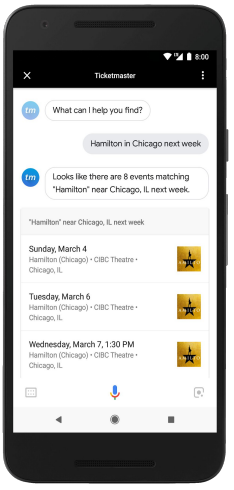
A “conversational experience” can be represented in different ways

1. Conversational interface
2. Conversational UX
3. Conversational app
4. Voice bot
5. Chat bot

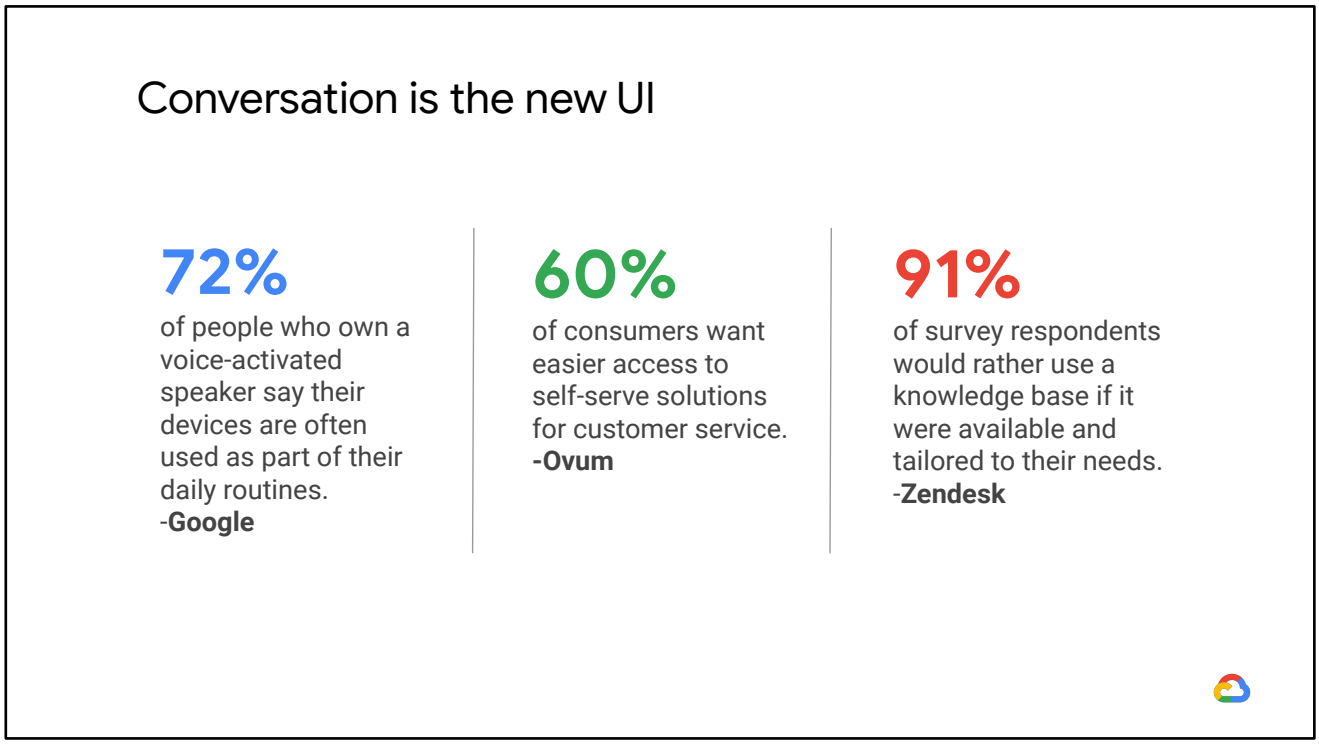
“Conversational experience” is the descriptive, comprehensive name for a new class of solutions that include chatbots, conversational apps, and other similar terms.

Defining a “conversational experience”

Any voice or chat interface that relies on Natural Language Understanding (NLU) for interacting with users.



The common denominator is the use of Natural Language Understanding,which today, is more driven by machine learning to power interactions with humans, rather than using the hard-coded scripts or decision trees of the past that made up previous generations of chatbots. Natural language understanding works by recognizing a user’s intent and responding accordingly based on training data.



Conversational experiences are quickly becoming a mainstream UI component for all kinds of apps. An entire generation of consumers already uses voice as the primary way to do search.

Conversational interface, Customer service, which has already seen widespread adoption of messaging and tree-based Interactive voice response, is the biggest likely commercial application for conversational experiences in the near future. Studies tell us that more and more customers prefer self-service over contacting a support agent; many say they would use a knowledge base if it met their needs. This is great news for businesses; self-service is the fastest and most cost-effective way to customer support.

https://www.thinkwithgoogle.com/consumer-insights/voice-assistance-consumer-experience/

There is a diverse set of use cases

Connecting businesses to their customers

Customer service

Commerce

Controlling IoT devices

Home entertainment

Auto

Connecting businesses to their employees

Organizational knowledge

Surfacing data and insights

Customer service and contact center applications are the most obvious use case today, but there are many others, from commercial sector to home entertainment to auto to surfacing data and insights.

Consumers have high expectations for these experiences -- just as high as they do for human engagement. Conversely, bad experiences can put brands at serious risk. let's take a look at the chatbots journey over the years and some of the challenges.

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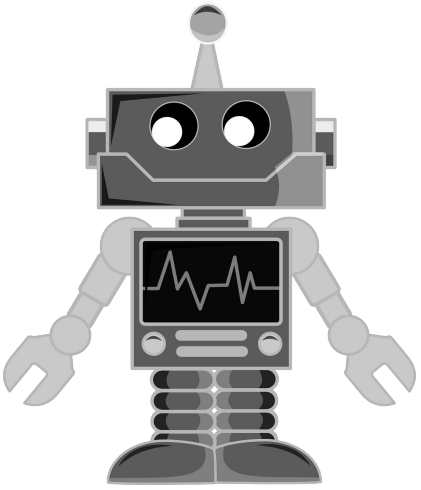
In this lesson, we'll discuss the history of chatbots and some of the challenges facing them.

Chatbots of the past were difficult to maintain



Creating engaging conversational experiences is hard without the right tools, expertise and resources.

Although chatbots are a current hot topic, they have been around for a while. One of the earliest program was called ELIZA built in 1966 at the MIT AI lab. It simulated a therapist by using a script to respond to a user's questions with simple pattern matching.

ELIZA (1966): https://www.youtube.com/watch?v=RMK9AphfLco

GOOGLE DUO (2018) https://www.youtube.com/watch?v=D5VN56jQMWM

FUTURE ???: https://www.youtube.com/watch?v=XsQqMwacZQw

Most of the bots of the past, built on top of decision trees, were difficult to maintain. The navigation from one user intent to another used to be difficult to handle, and relied on hard-coded responses and logic. This often resulted in a sub-par user experience. Over the years, chatbots incorporated newer techniques, however, building experiences that meet consumers' high expectations requires sophisticated tools and the right expertise that solve the hardest problems right out of the box.

So let's take a look at some of these challenges...

https://pixabay.com/en/robot-machine-technology-science-312566/

There are challenges to building conversational interfaces

NLU doesn't grow on trees!	Few companies have the expertise to do NLU as well as consumers expect.
Maximizing reach takes effort	Building support for multiple languages, platforms, devices, and apps is complex.
Enterprise integration is critical	Integration with backend services (e.g., CRM) requires open, flexible infrastructure.
Don't try to boil the ocean	Is this a strong use case? What can the bot do well?
Human escalation protocol is necessary	Very few chatbots have an escalation workflow in place to let a human take over the conversation when the bot cannot help.

While companies are becoming more and more aware of consumers' high expectations for conversational interfaces, few of them actually are equipped with the right tools and experience to fulfill these expectations for natural language understanding capabilities.

Trying to build out a conversational interface yourself from scratch is complicated. You need to consider supporting multiple languages and dialects, platforms, and devices in order to maximize reach.

It is also crucial to incorporate backend enterprise services, such as CRM, which requires a flexible infrastructure architecture.

There are a plethora of bots that are solving for irrelevant use cases, or that offer really poor experiences. Bots that do one thing well are more helpful than bots that do many things poorly. It is also best if the bot can handle passing on more complicated interactions to a human.

Being able to escalate to a human is important, but knowing when to escalate is critical. With sentiment analysis, your chatbot should also be able to gracefully handle routing a conversation to a human operator based on context.

Now that you are more familiar with the challenges, let's talk about how Dialogflow can address some of them and help you build smart conversational agents that deliver rich experiences.

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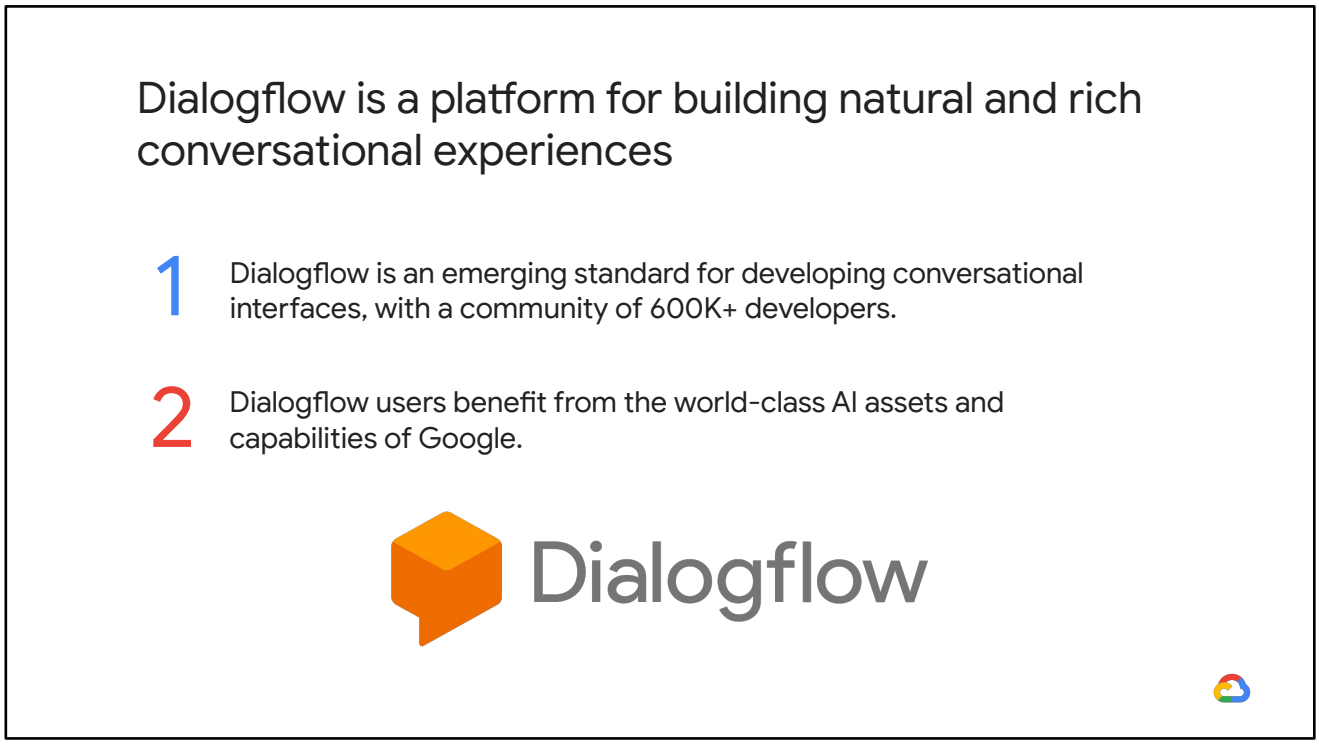
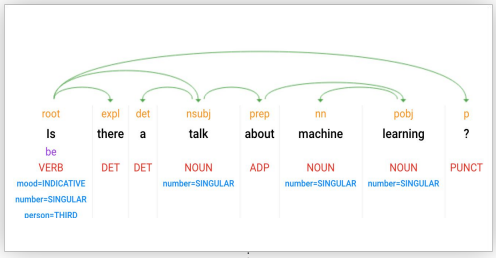
In this lesson, we'll look at the building of engaging conversational interfaces using Dialogflow.



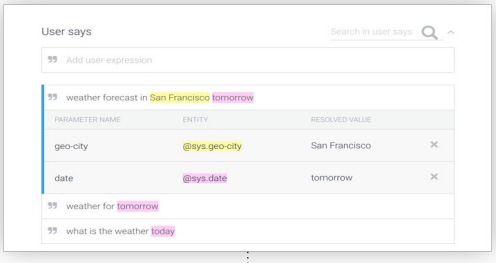
We will now talk about Dialogflow, a tool that can help you build smart conversational agents.
Dialogflow is an end-to-end developer platform for building natural and rich conversational experiences.
It was formerly named api.ai until Google acquired and rebranded it into Dialogflow.
At its core, Dialogflow is a powerful natural language understanding (NLU) engine to process and understand natural language input.In other words, it lets you easily achieve a conversational user experience by handling the natural language understanding (NLU) for you.
And did you know the google assistant in your phones and home devices is actually powered by Dialogflow?

Dialogflow is seeing continuous growth in its developer community and is becoming a conversational experience standard.
Google is an AI company with a goal to make AI easy, fast, and useful for enterprises and developers.
Dialogflow is built on some of the same world-class AI assets and capabilities that were originally developed for products like Gmail and Search, with new ones being utilized on an ongoing basis. It incorporates the ever-growing AI experience of Google, including machine learning expertise, search capabilities, speech recognition, and of course natural language understanding.

Natural language processing is a game changer



Syntax analysis



Entity recognition

Google natural language processing capabilities include syntax analysis, which allows you to extract tokens and sentences, identify parts of speech (PoS) and create dependency parse trees for each sentence.

Entity recognition enables your agent to identify entities and label by types such as person, organization, location, events, products and media.

Natural language processing is a game changer

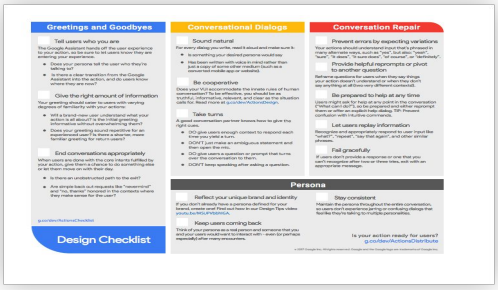
Sentiment analysis

Sentiment analysis gives an understanding of the overall sentiment expressed in a block of text. **Sentiment Analysis** inspects the given text and identifies the prevailing emotional opinion within the text, especially to determine a writer's attitude as positive, negative, or neutral. For example, understanding how customers feel about a new product launch through the reviews.

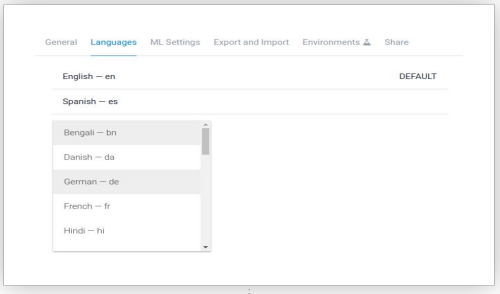
https://pixabay.com/en/emotion-face-happy-laughing-round-1298793/

https://pixabay.com/en/angry-face-emoticon-animations-33059/

Natural language processing is a game changer

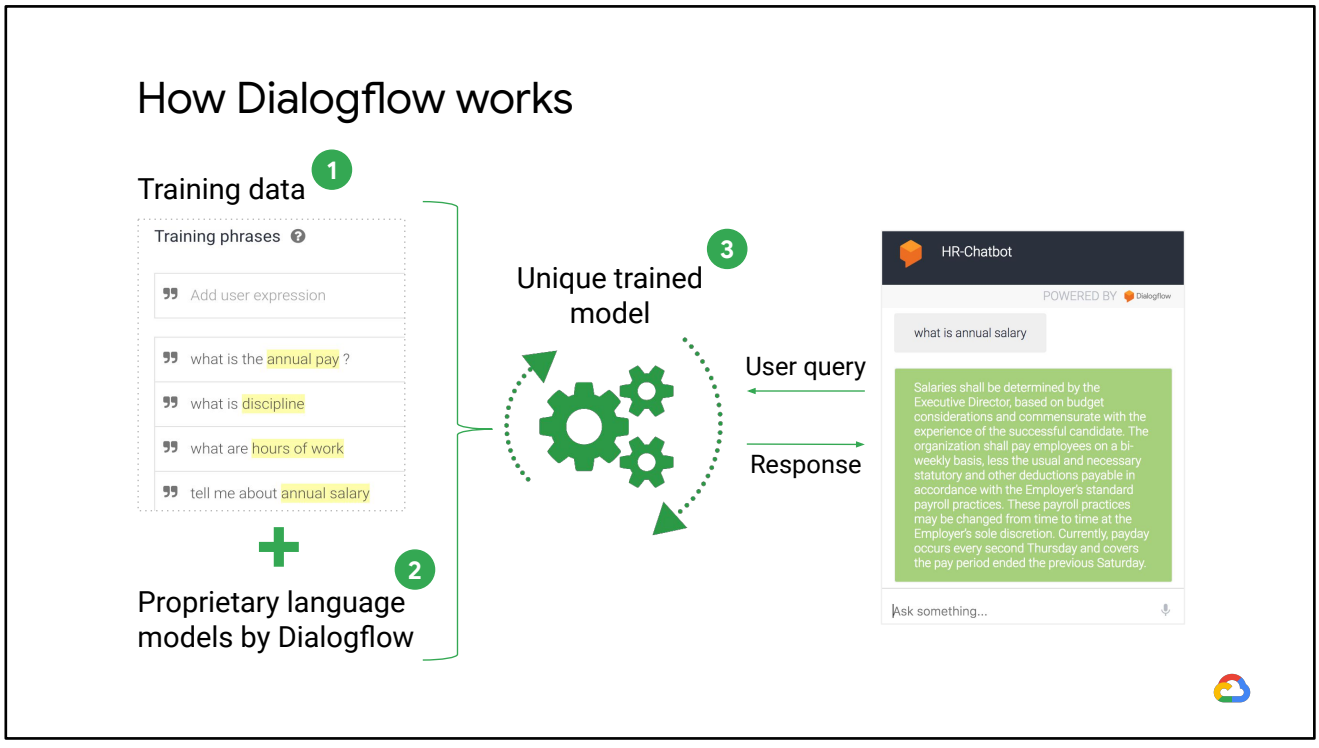


Content classification



Multi-language support

Content classification allows you to classify documents in over 700 predefined categories, and multi-language support includes the ability to easily analyze text in multiple languages.



By leveraging these capabilities and what the developer provides as input training data, Dialogflow creates unique algorithms for each specific conversational agent under the hood, which continuously learns and is tweaked for you as more and more users engage with your agent.

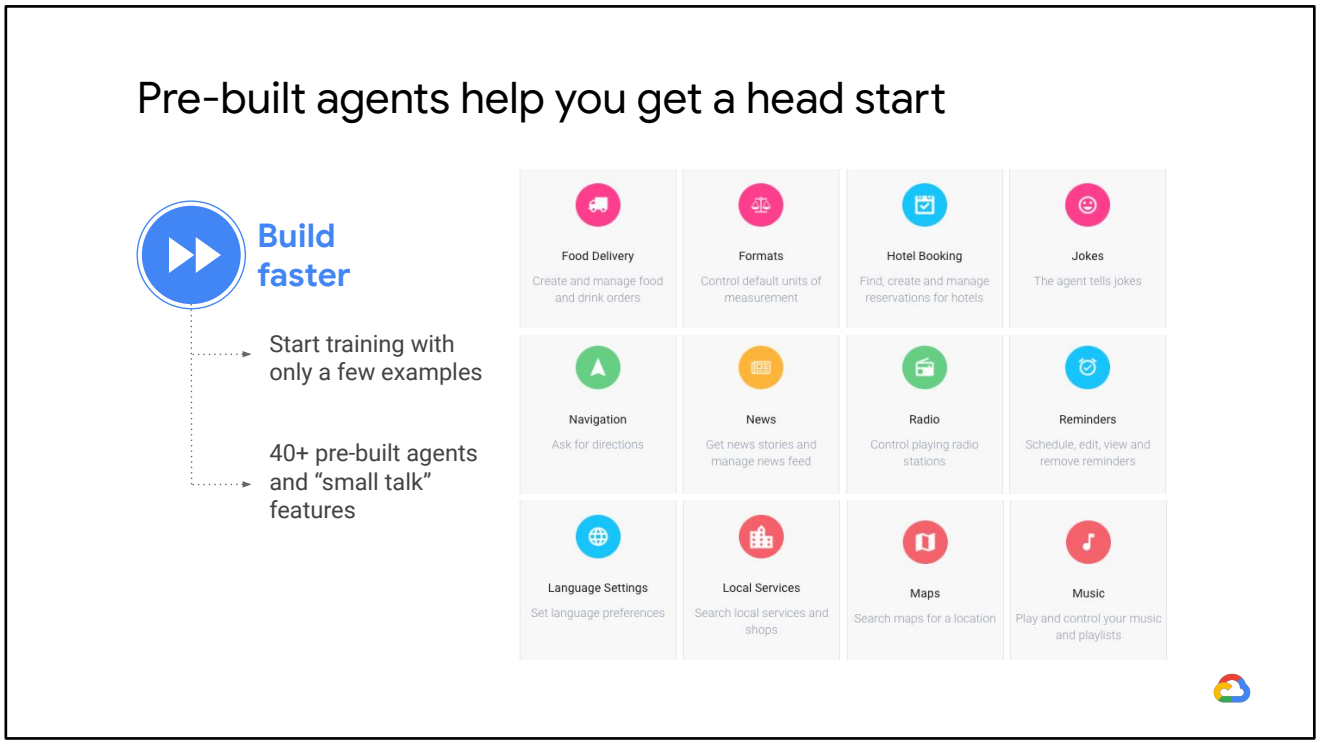
Dialogflow benefits for users

Build faster

Engage more efficiently

Maximize reach

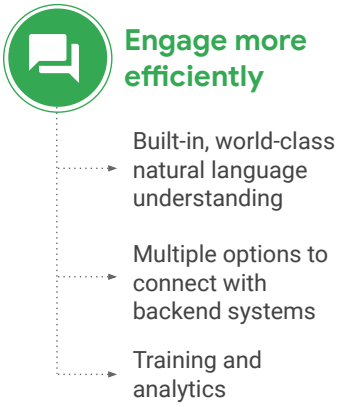
Using Dialogflow, you can build conversational experiences faster, engage end-users more efficiently, and maximize reach across geographies and platforms.

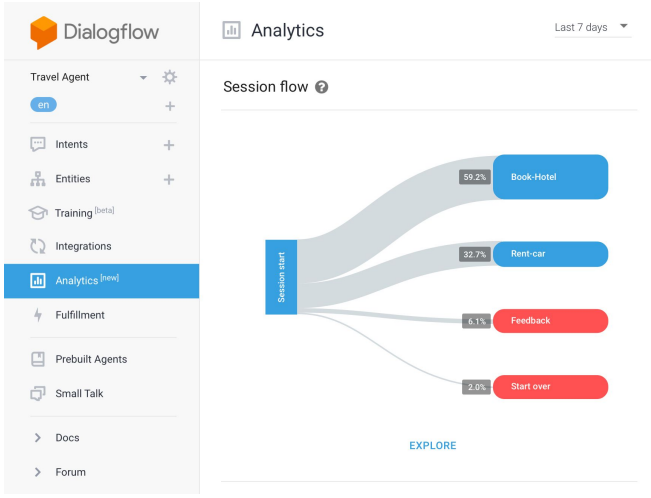


Build your agent quickly by starting with just a few training phrases or using one of over 40 prebuilt agents.

These prebuilt agents can be used directly out of the box, or imported into your agent to build on and customize for your own use case. These include everything from food delivery to hotel reservations to news and reminders. You can easily import these prebuilt agents from the Dialogflow console.

Analytics offer insights about needed improvements

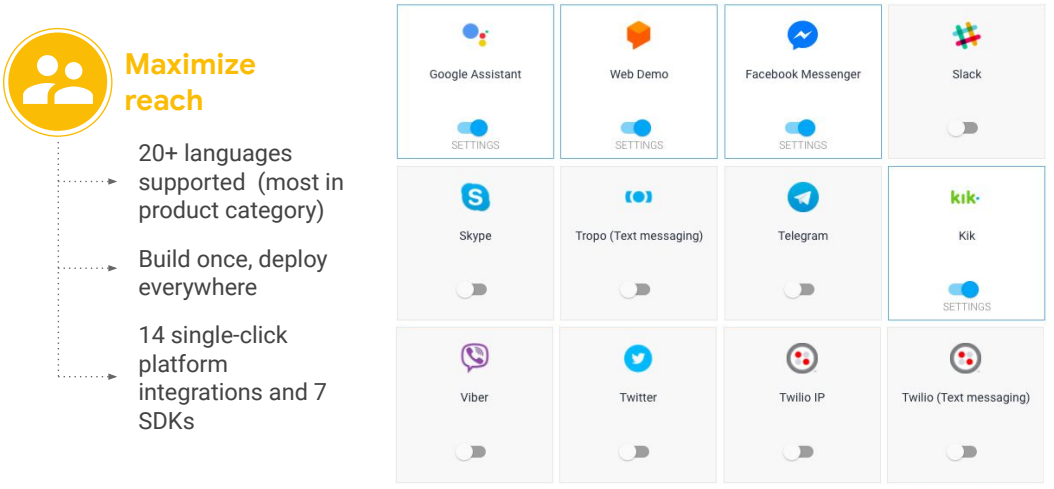




You can rely on Dialogflow's built-in natural language understanding capabilities, model training and analytics that are already taken care of for you.

Dialogflow's built-in Analytics can tell you a lot about users' interactions with your agent. For example, it can show you the breakdown of how often different intents are triggered. This shows you how your users are spending their time in conversation with your agent. This can also help you prune any underutilized intents.

One-click integrations with most major platforms



You can easily deploy your agent on multiple platforms and utilize Single-click integrations, such as Facebook Messenger, Kik, Twilio, Twitter, Slack, Cisco Spark, etc.

The Google Assistant integration allows you to quickly deploy your agent to any Assistant-enabled platform, such as the mobile app or a Google Home device. The Web Demo integration allows you to test out your chatbot in an embedded webpage. There are also integrations for other popular apps such as Facebook Messenger, Slack and Twitter, which are enabled with quick authentication.

With all these features and the natural language understanding good built in, lets see the kind of smart,rich, relevant conversations that Dialogflow can bring to life.

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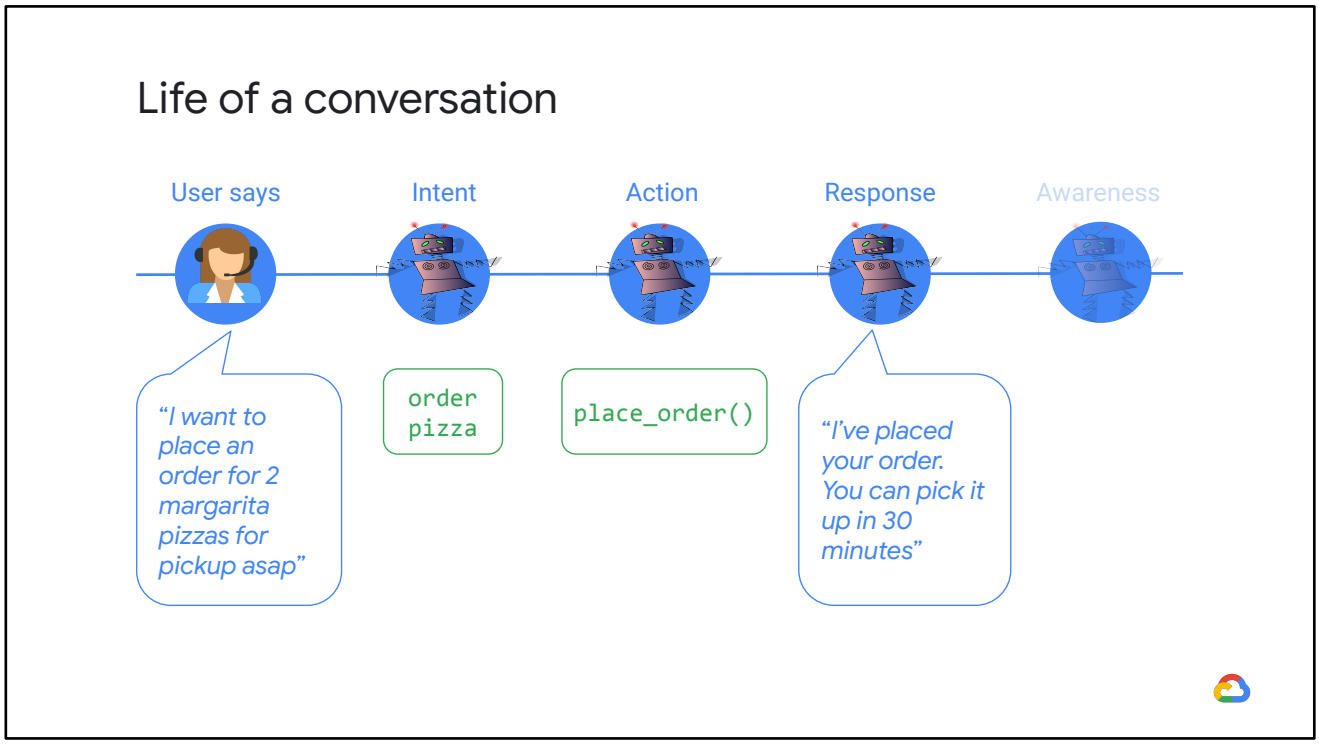
In this lesson, we'll take a closer look at the different phases of a conversation to understand what elements your conversational agent will need to have.



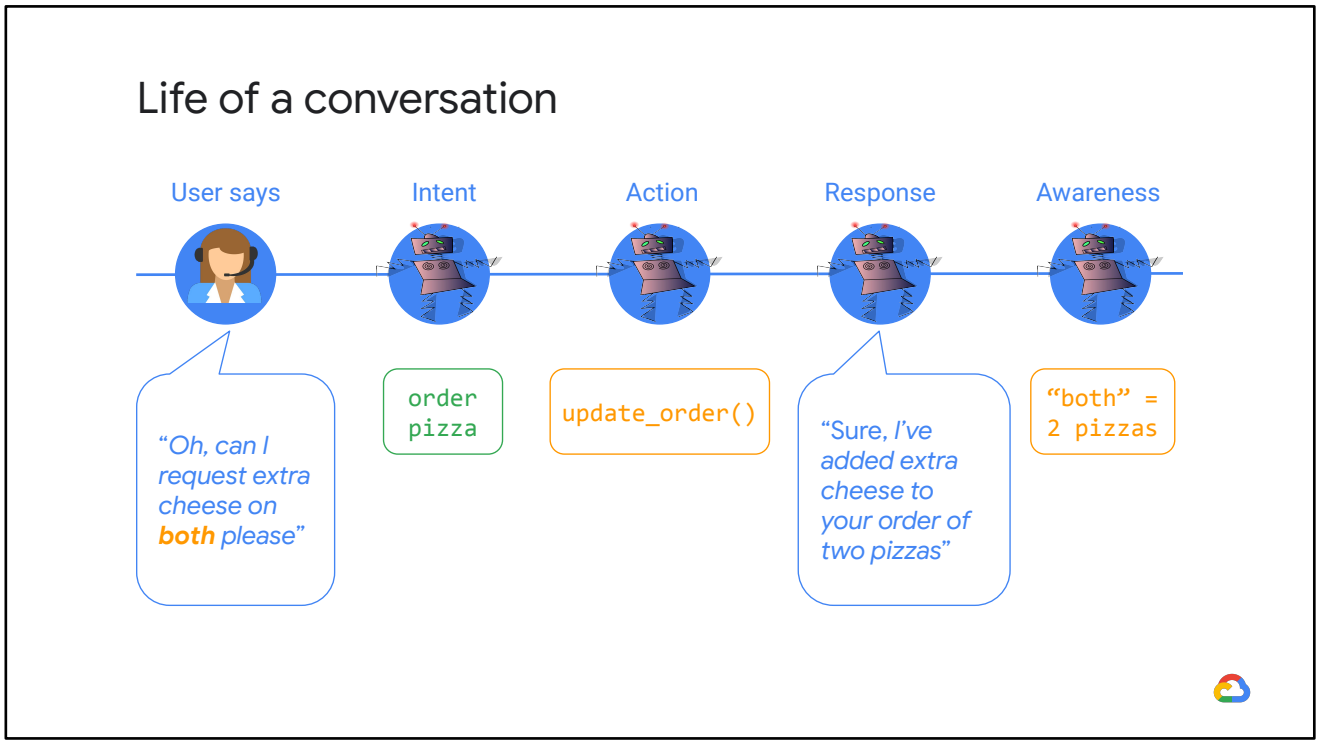
Naturally, it starts with the user who needs something from the agent, and initiates a conversation to say what they need.
The agent needs to match this to an intent that's is programmed to handle the request.

When the user states their pizza order, the matching intent for 'order pizza' is recognized. This intent is comprised of multiple components: what the user actually says, the action to take, the agent's response, and the awareness of the context.

This intent kicks off the action, which is to place the order. This could be like a backend functionality that processes the order.

Then the agent can deliver the appropriate response, such as confirming that the user's order has been placed.

https://pixabay.com/en/bot-dance-robot-android-mechanical-151516/
https://pixabay.com/en/customer-support-service-help-2533659/



The agent also needs to be able to handle conversation branching that doesn't always follow this exact flow. For example, what if the user ordering pizza makes an additional request for their order?

The agent needs to foster a natural conversation that learns from past exchanges. It can circle back to the same intent and add an additional layer of context or awareness, so that it understands that the word "both" in the user's request refers to the 2 pizzas that they are ordering.

Your agent can seamlessly adjust the order and accommodate the user's additional request.

https://pixabay.com/en/bot-dance-robot-android-mechanical-151516/
https://pixabay.com/en/customer-support-service-help-2533659/

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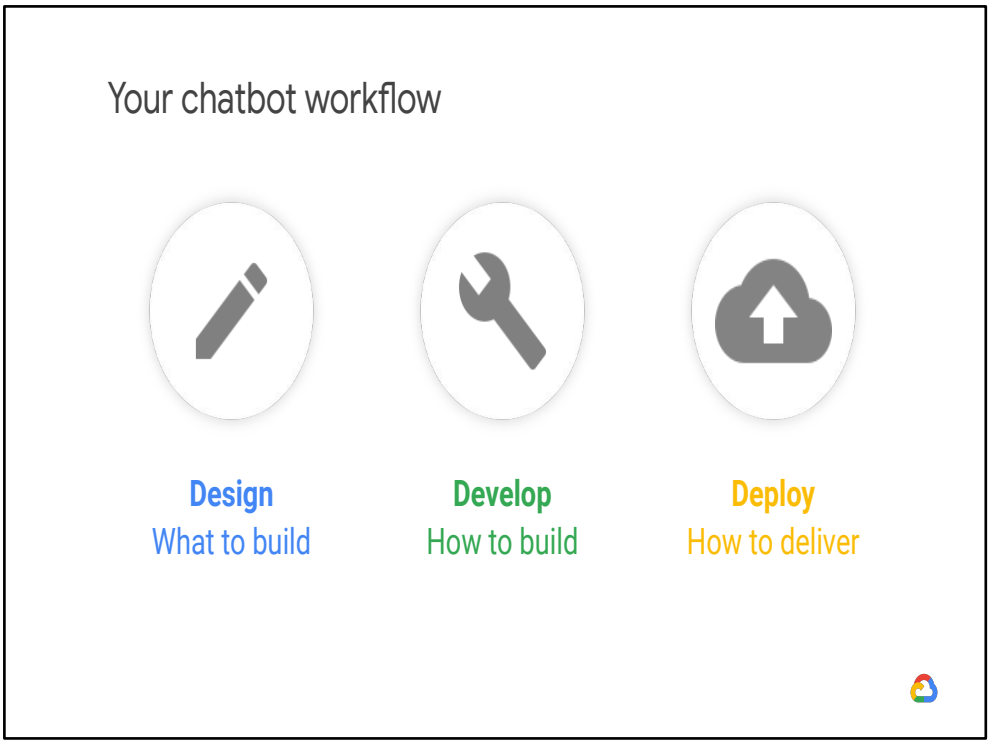
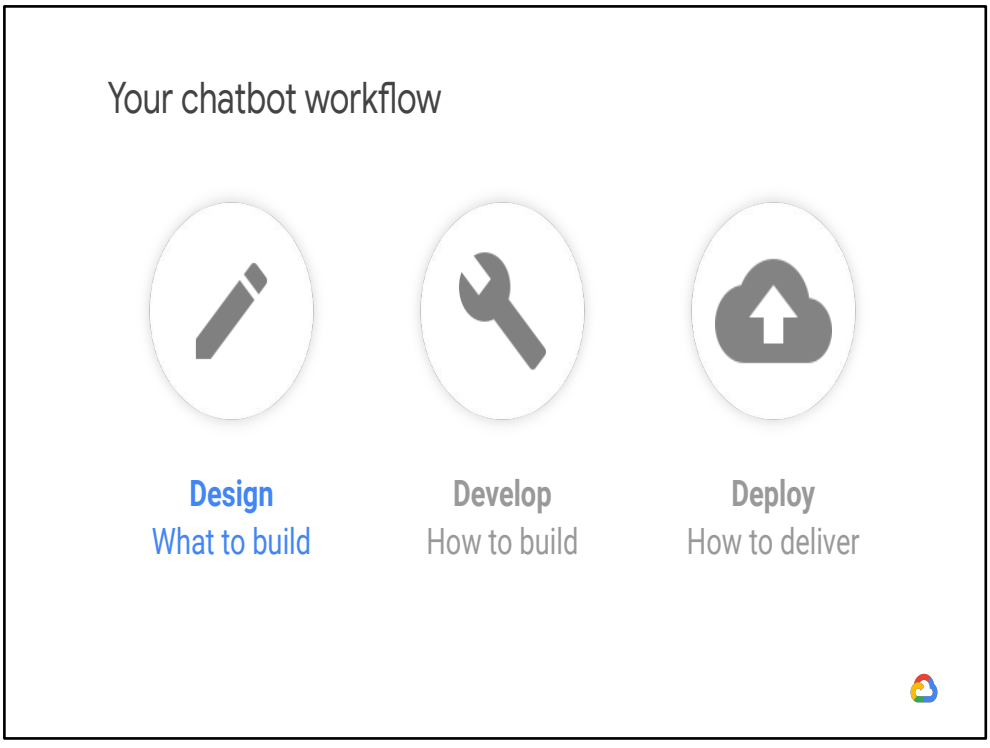
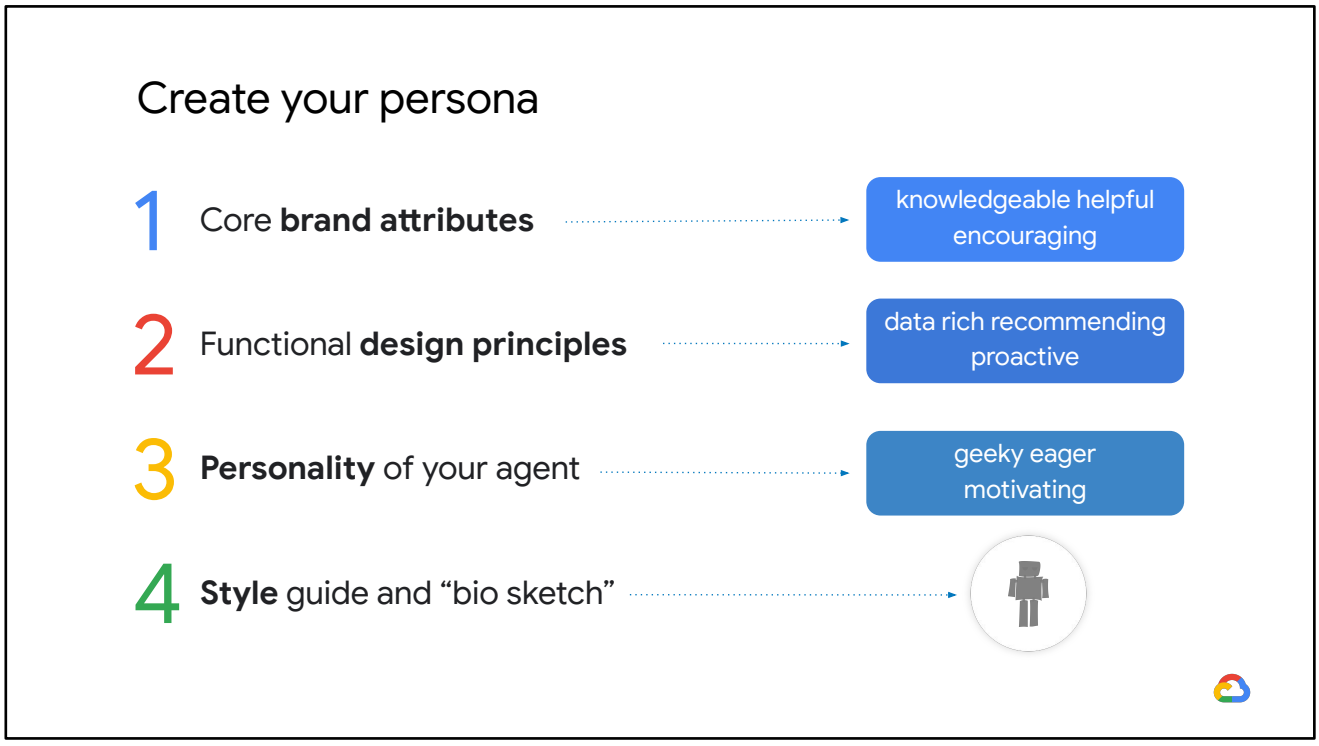
In this final lesson pf the module, we'll look at a typical workflow to get your conversational agent up and running.



Some conversational agents exist for very specific, very simple use cases with few intents and minimal dependency on communicating with backend systems or knowledge bases. While some have multiple intents, dealing with more complex domains and backends. But typically, the workflow to get your conversational agent up and running, maps out to these 3 phases.



In the design phase, you decide the personality and tone of your chatbot based on your brand. Is it funny or geeky, is it be proactive (such as making suggestions to users) or reactive (simply responding to user requests).



A persona is a UX concept that helps people relate by triggering familiar conversational patterns. The persona should leverage the existing experience already established or expected by your intended audience. It’s important to keep the persona in mind when creating your chatbot.

1. List out your core brand attributes - what words define the experience you’re shooting for?
2. Correlate those words to attributes that will define your functional design principles - how will those manifest in the design?
3. Define some attributes that you’d want to infuse into the **voice**, **style** of writing, and personality of the **dialog**
   What personality traits match your strategy?
4. And, consider the style guide & “bio sketch” of your agent. This means you need to think of your agent’s *practical application and maintain consistency for longevity of your experience.*

Example style guide

MIGHT SAY THINGS LIKE	WOULD NEVER SAY
I found ...	I did not receive a response
Up for that?	If you feel you have reached this message in error
Does that sound good?	Please select from one of the following X options
Maybe later	To help us serve you better ...
While you're at it ...	For questions related to ...
What's going on?	You have entered ...
So you can keep up to date on ...	That was an invalid ...
I'll look it up right now	We require that you ...
Sure, that's coming up	Please try again
Right around the corner from ...	For faster answers ...
That session's full, but ...	We're sorry, we are unable to ...
You might like ...	I did not understand

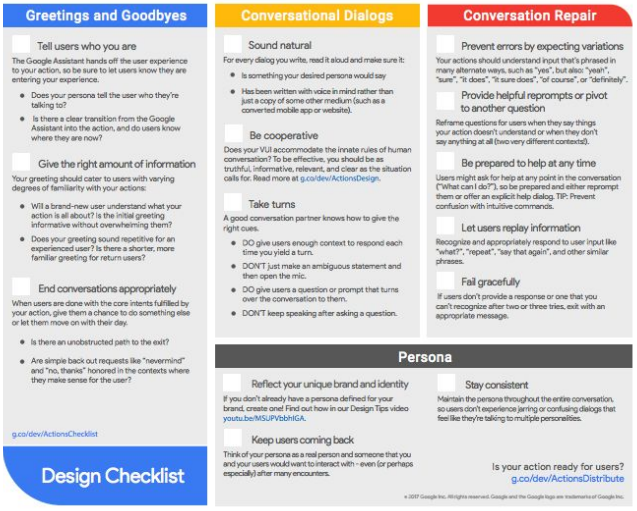
Keep the style guide in mind as you design your agent's responses. For the best user experience, you probably don't want your agent to sound too formal or robotic. For example, to make your agent more reminiscent of actual human conversation, you might have it say something like "Does that sound good?" rather than "If you feel you have reached this message in error…"

Example style guide

INSTEAD OF...	IS MORE LIKELY TO SAY...
allows	lets
require	need
unable to	can't
due to	because
additional	more
regarding	about
assist	help
currently	right now
please hold	one sec
remain	stay

You can even consider the style guide at the word-by-word level. For example, rather than having your chatbot say more formal words such as “regarding”, you might say “about”.

Consider the conversation design checklist



Greetings and Goodbyes

Tell users who you are

The Google Assistant hands off the user experience to your action, so be sure to let users know they are entering your experience.

- Does your persona tell the user who they're talking to?
- Is there a clear transition from the Google Assistant into the action, and do users know where they are now?

Give the right amount of information

Your greeting should cater to users with varying degrees of familiarity with your actions:

- Will a brand-new user understand what your action is all about? Is the initial greeting informative without overwhelming them?
- Does your greeting sound repetitive for an experienced user? Is there a shorter, more familiar greeting for return users?

End conversations appropriately

When users are done with the core intents fulfilled by your action, give them a chance to do something else or let them move on with their day.

- Is there an unobstructed path to the exit?
- Are simple back out requests like "nevermind" and "no, thanks" honored in the contexts where they make sense for the user?

g.co/dev/ActionsChecklist

Design Checklist

Conversational Dialogs

Sound natural

For every dialog you write, read it aloud and make sure it:

- Is something your desired persona would say
- Has been written with voice in mind rather than just a copy of some other medium (such as a converted mobile app or website).

Be cooperative

Does your VUI accommodate the innate rules of human conversation? To be effective, you should be as truthful, informative, relevant, and clear as the situation calls for. Read more at g.co/dev/ActionsDesign.

Take turns

A good conversation partner knows how to give the right cues.

- DO give users enough context to respond each time you yield a turn.
- DON'T just make an ambiguous statement and then open the mic.
- DO give users a question or prompt that turns over the conversation to them.
- DON'T keep speaking after asking a question.

Conversation Repair

Prevent errors by expecting variations

Your actions should understand input that's phrased in many alternate ways, such as "yes", but also: "yeah", "sure", "it does", "it sure does", "of course", or "definitely".

Provide helpful reprompts or pivot to another question

Reframe questions for users when they say things your action doesn't understand or when they don't say anything at all (two very different contexts!).

Be prepared to help at any time

Users might ask for help at any point in the conversation ("what can I do?"), so be prepared and either reprompt them or offer an explicit help dialog. TIP: Prevent confusion with intuitive commands.

Let users replay information

Recognize and appropriately respond to user input like "what?", "repeat", "say that again", and other similar phrases.

Fail gracefully

If users don't provide a response or one that you can't recognize after two or three tries, exit with an appropriate message.

Persona

Reflect your unique brand and identity

If you don't already have a persona defined for your brand, create one! Find out how in our Design Tips video youtu.be/MSJPVbbhIGA.

Stay consistent

Maintain the persona throughout the entire conversation, so users don't experience jarring or confusing dialogs that feel like they're talking to multiple personalities.

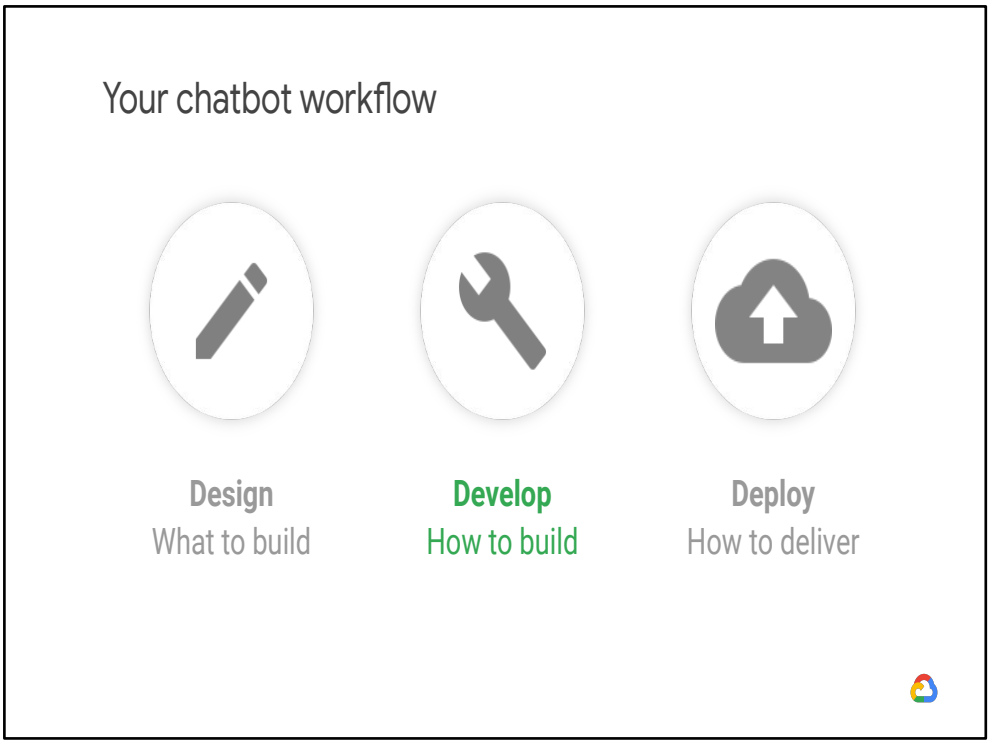
Keep users coming back

Think of your persona as a real person and someone that you and your users would want to interact with - even (or perhaps especially) after many encounters.

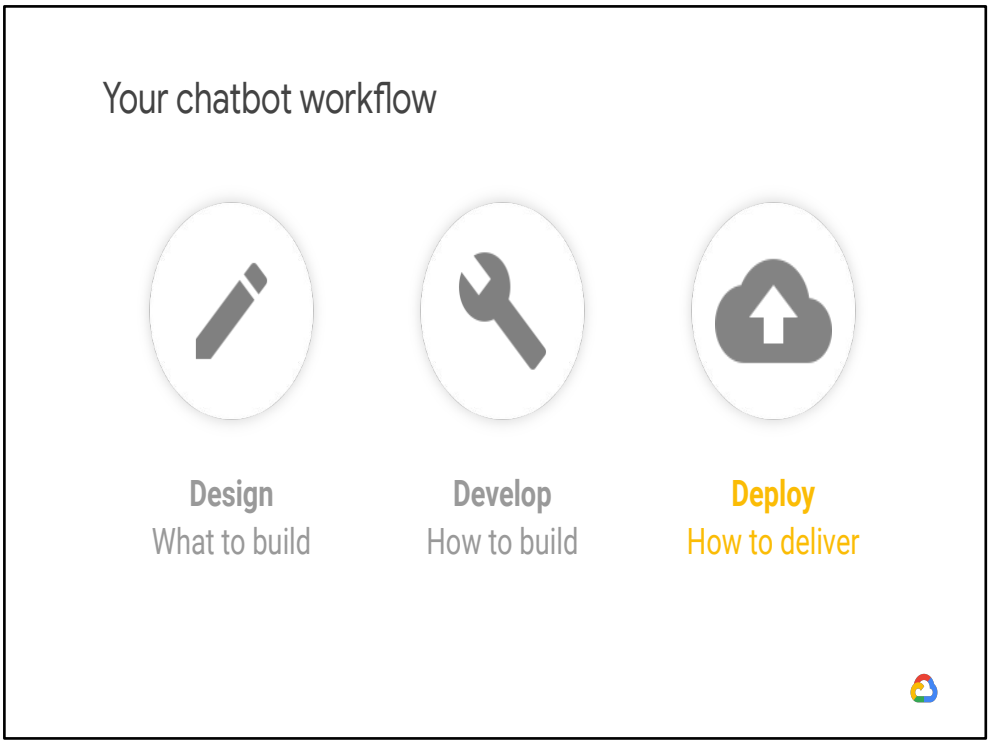
Is your action ready for users?
g.co/dev/ActionsDistribute

https://dialogflow.com/docs/agents/AgentDesignChecklist.pdf

Another thing to consider when building your agent is the overall conversation design checklist. Consider how your agent will greet a user and end a conversation, how the conversation is meant to flow for a first-time user versus a returning user, how your agent should repair a conversation and how your agent will fail gracefully, and what the overall consistent personality of your agent should be.



After you have looked at the design considerations, you are ready to develop your conversational agent.
In the Develop phase, you actually use Dialogflow to create your agent, with a combination of directly adding intents and responses in the console and writing code to connect to backend services.



The Deploy phase mostly depends on what the different components that your chatbot needs to consider, and which applications it will touch. Think about security, integrations, and scaling. These will all help determine which platforms your chatbot needs to account for.

Over the next few modules. you will learn how to develop your conversational agent with Dialogflow, and use Google Cloud products to deliver your agent and its services.

Group Activity

1. **Pick Use cases**
   i.e. Pizza ordering, Internal QnA platform

2. **Create a Persona**
   a. Give it a name (with invocation name if using Voice)
      i.e. Genie, Pizzabot, OK Google

   b. Give it a style and tone
      i.e. formal, friendly, gender(Male, Female), joyful

   c. Write sample dialogs

https://developers.google.com/actions/dialogflow/design-conversation#example

3. **Deployment considerations**
   a. How will your bot interact with customers?
      i.e. Phone, Chatting app, Browser, ...

   b. Who is the targeted customer?
      i.e. customers requesting for customer service

a. How will you gather data for training?
   i. e. based on the historical data of a call center. Process data > Feed in

b. Other considerations

cloud.google.com