

Computación Ubicua

Sesión 3 – Asistentes Virtuales

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Definición

- Un asistente virtual es un agente de software que ayuda a usuarios de sistemas computacionales, **automatizando y realizando tareas** con la mínima interacción hombre-máquina



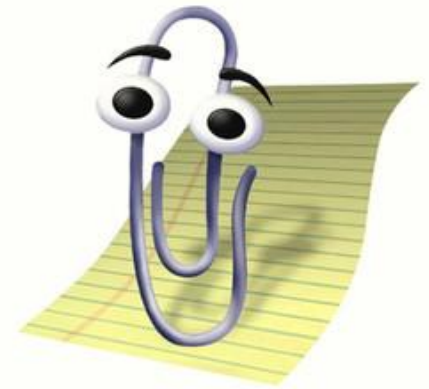
Historia

- 1961 – IBM Shoebox, primera herramienta con reconocimiento digital de voz. Reconoce 16 palabras y dígitos de 0 a 9
- 1970 – Harpy dominó 1 millón de palabras
- 1980 – Primer sistema capaz de reconocer cadenas de palabras
- 1990 – IBM, Microsoft, Philips y Lernout & Hauspie incorporan reconocimiento de voz a sus computadoras personales
- 1994 – IBM Simon, primer teléfono inteligente



Historia

- 1996 – Microsoft incorpora un asistente a Office llamado Clippy
- 2011 – Siri, primer asistente virtual instalado en un teléfono
- 2014 – Amazon lanza el altavoz Amazon echo
- 2016 – Google comercializa Google Home



Dispositivos con asistentes virtuales

- Altavoces inteligentes (Amazon Echo, Google Home)
- Aplicaciones de mensajería instantánea (Whatsapp)
- Como parte del sistema operativo (Siri, Cortana)
- En un modelo de teléfono concreto (Bixby)
- Aplicaciones móviles específicas (Cortana, Google Assistant)
- Relojes inteligentes
- Electrodomésticos

Método de interacción

- Los asistentes virtuales permiten interactuar por:



Texto

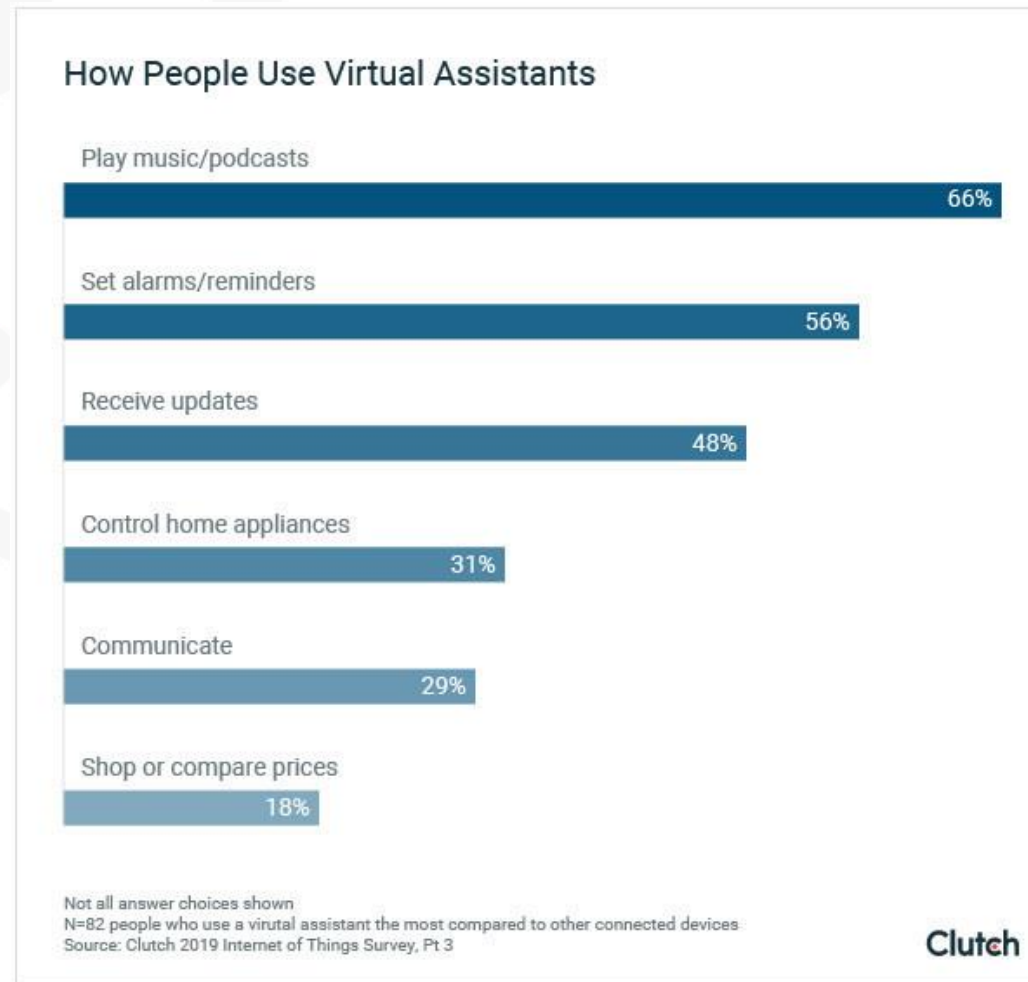


Voz

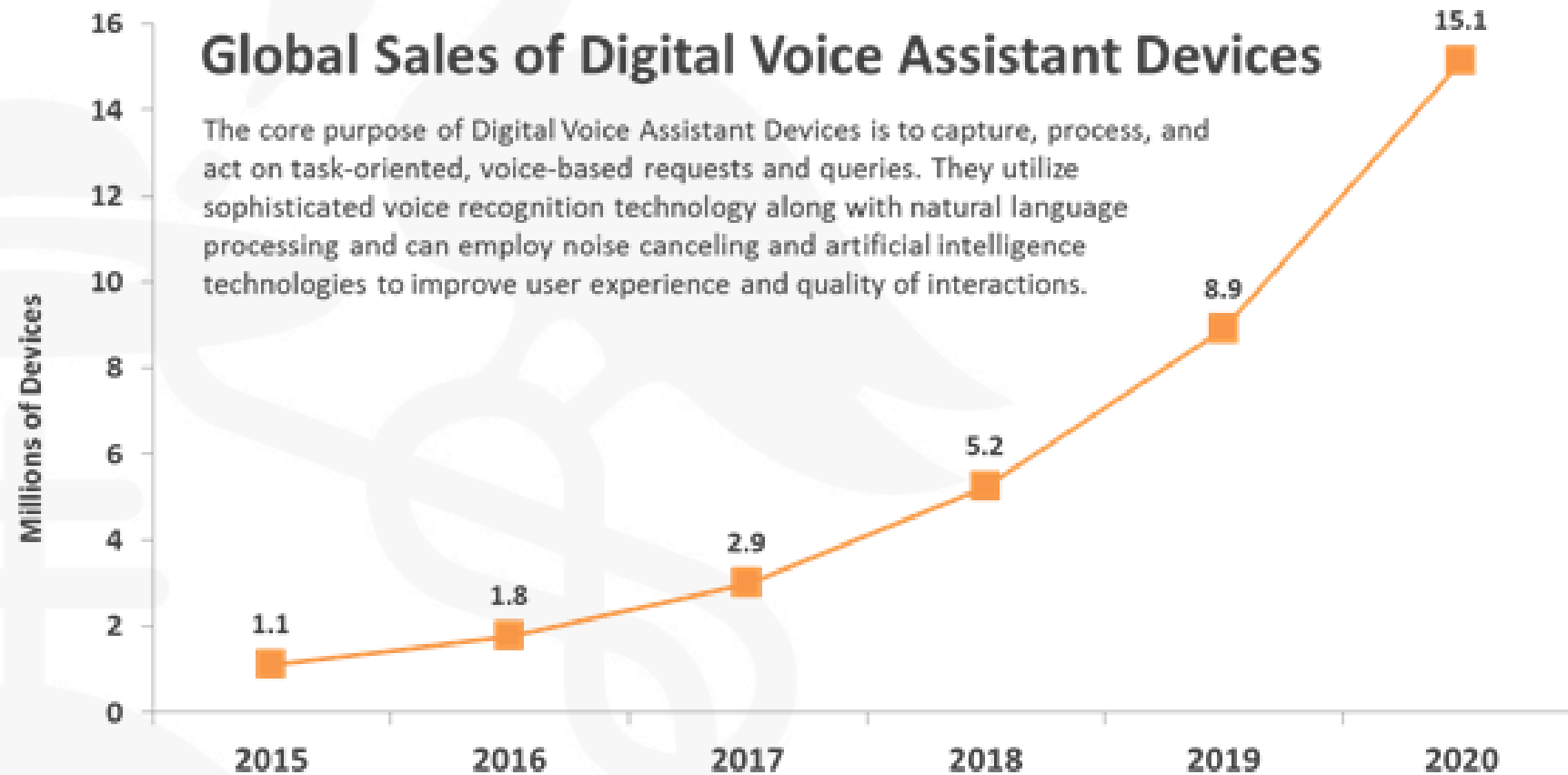


Imágenes

Principales Usos de los asistentes Virtuales



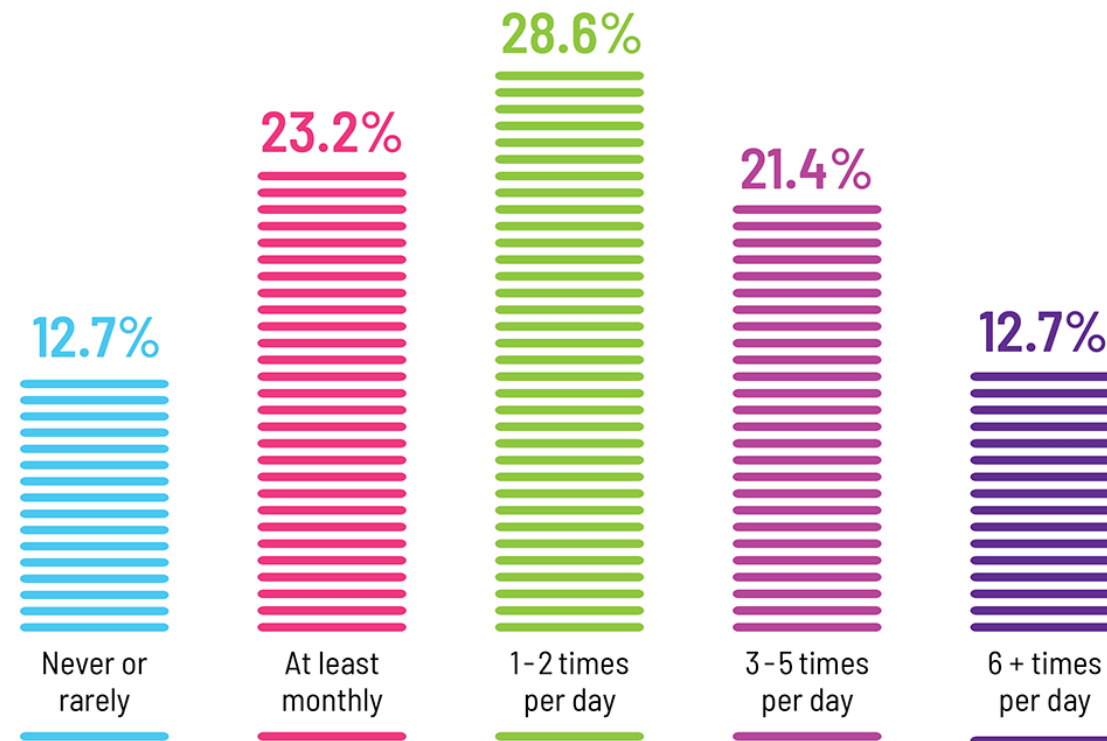
Evolución de ventas de asistentes virtuales



© 2016 Strategy Analytics

Frecuencia de uso

Frequency of Smart Speaker Use



Source: Voicebot Smart Speaker Consumer Adoption Report January 2018



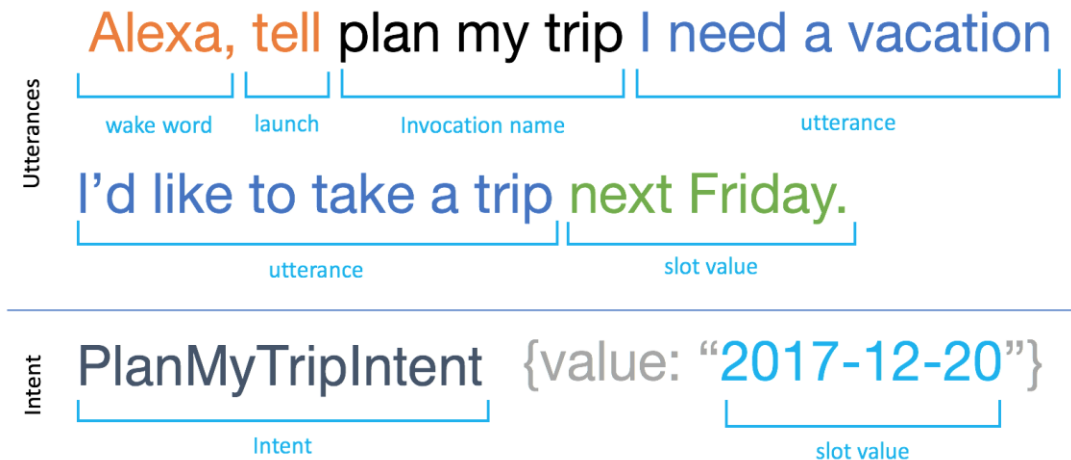
Reconocimiento de voz

Alexa, tell plan my trip I need a vacation

I'd like to take a trip next Friday

Reconocimiento de voz

- **Intents:** Solicitud o acción principal asociada con el commando del usuario
- **Slots:** Argumentos para un intent que proporcionan mas información. Pueden ser obligatorios u opcionales
- **Utterances:** Palabras que los usuarios dicen para transmitir lo que quieren que Alexa haga



Cortana

- Asistente virtual creado por Microsoft como pieza clave en su cambio de imagen
- Lleva el nombre de un personaje del videojuego Halo
- Comenzó su desarrollo en 2009 pero no fue presentado hasta 2013
- Cortana está disponible para Windows 10, Windows Phone, Android y Xbox One

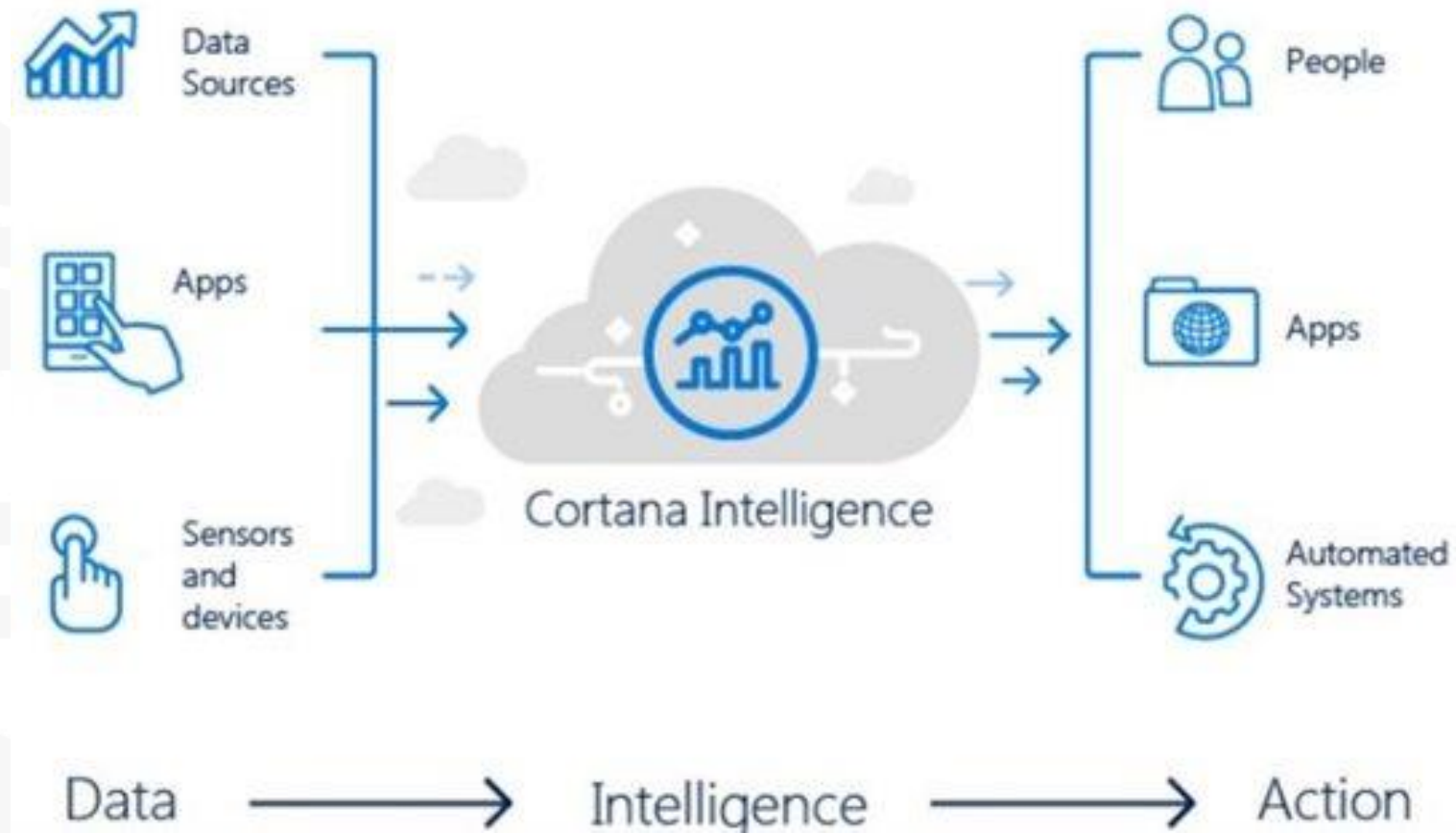


Cortana

- Acciones posibles con Cortana:
 - Comandos por voz
 - Abrir aplicaciones del sistema
 - Gestión del calendario
 - Buscar información a través de Internet
 - Contar la información destacada del día
 - Buscar archivos del sistema
 - Interactuar con las características del dispositivo



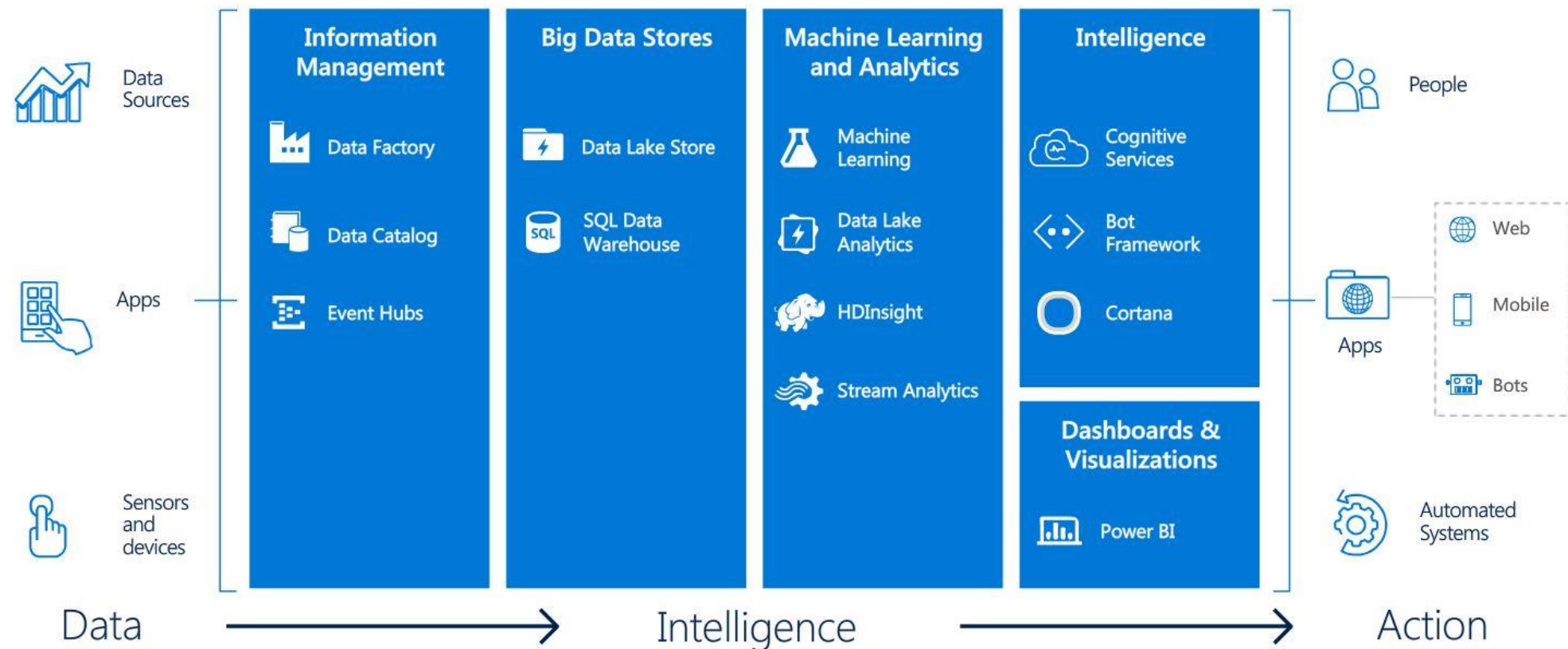
Cortana - Arquitectura



Cortana - Arquitectura

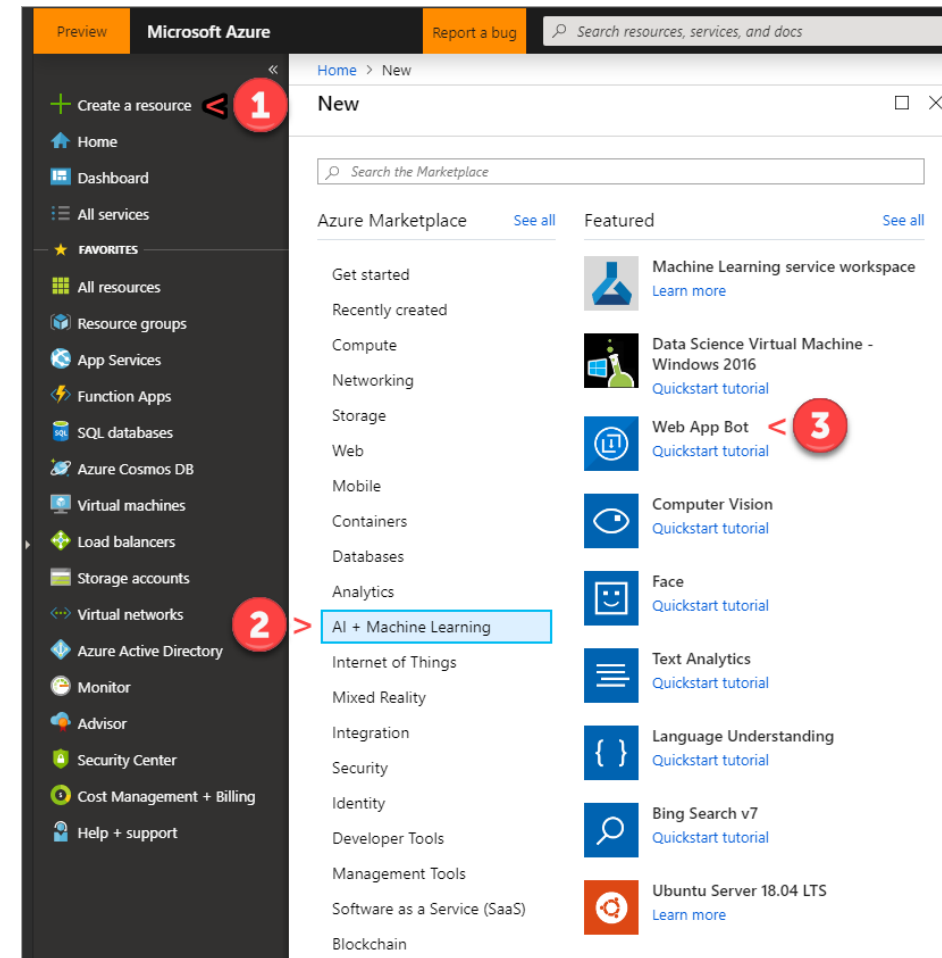
Cortana Intelligence Suite

Transform data into intelligent action



Cortana – Creación de una Skill básica

- La creación de Skills para Cortana se realizará por medio de Microsoft Azure
- Dentro de la cuenta debemos seguir los siguientes pasos:
 1. Crear recurso
 2. AI + Machine Learning
 3. Web App Bot



Cortana – Creación de una Skill básica

Home > New > Web App Bot

Web App Bot

Bot Service

* Bot name ⓘ

* Subscription

* Resource group

[Create new](#)

* Location ⓘ

Pricing tier ([View full pricing details](#))

* App name ⓘ

.azurewebsites.net

* Bot template >
Basic Bot (C#)

* LUIS App location

* App service plan/Location >
TestServicePlan/West US

Application Insights ⓘ
☒ On ☐ Off

* Application Insights Location ⓘ

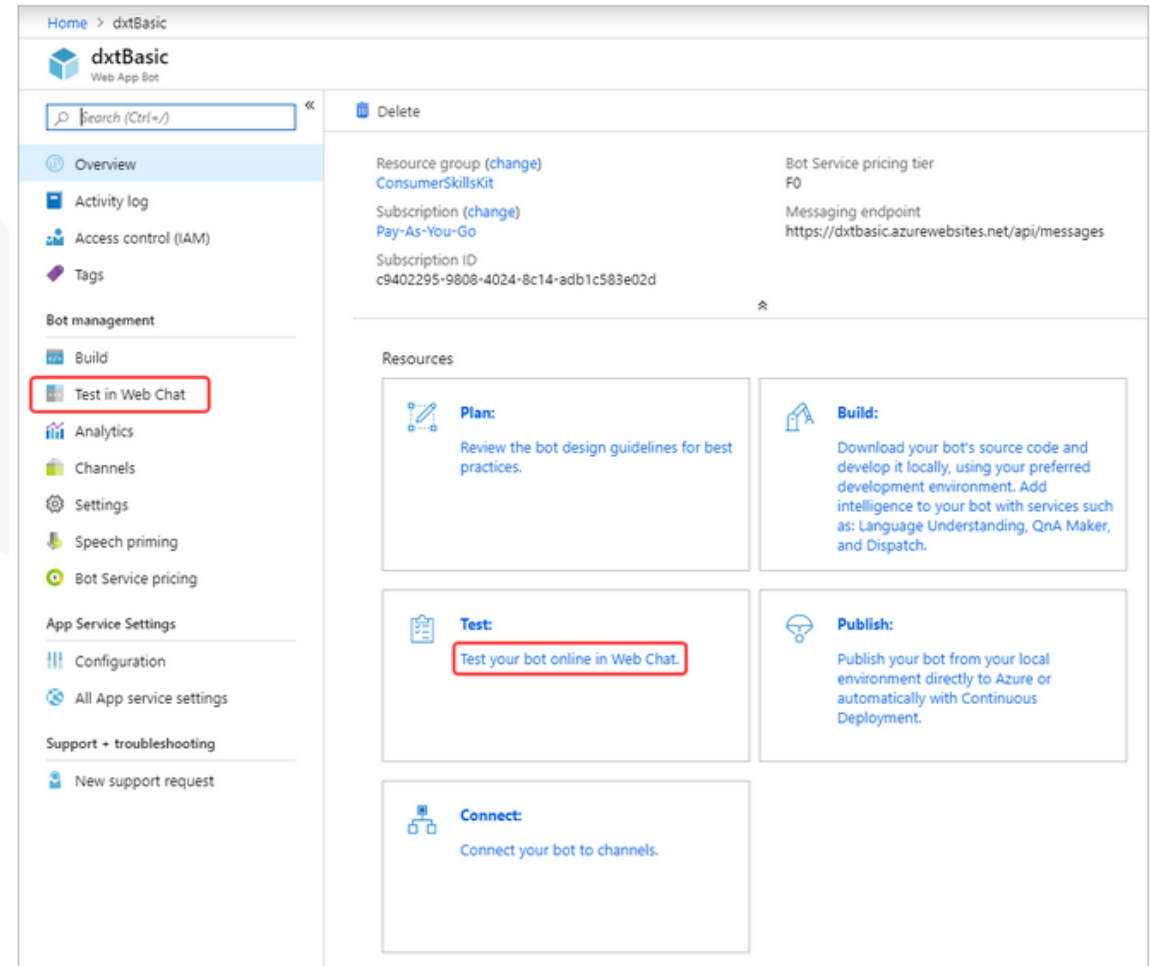
Microsoft App ID and password ⓘ >
Auto create App ID and password

[Create](#) [Automation options](#)

Cortana – Creación de una Skill básica

○ Una vez creado el bot podremos:

- Probarlo online
- Revisar el diseño
- Descargar/Cargar el código
- Publicarlo
- Conectarlo a canales



Alexa

- Asistente virtual desarrollado por Amazon en 2014
- Se llama igual que el sistema de navegación de Star Trek.
- Su nombre se escogió porque la 'X' es una consonante complicada, lo cual facilitaría reconocer el nombre.
- Creado para ser incorporado a altavoces inteligentes "Echo"
- Para poder configurarlo es necesaria una aplicación móvil



Alexa

- Acciones posibles con Alexa:
 - Reproducir música de servicios como Spotify o Amazon Music
 - Crear listas de comprobación
 - Establecer alarmas o temporizadores
 - Reproducir podcasts y audiolibros
 - Controlar dispositivos inteligentes
 - Proveer información en tiempo real como noticias o el clima



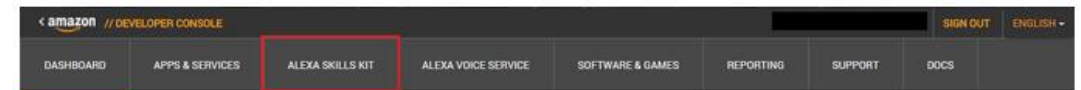
Alexa - Architecture

Alexa Custom Skill - Reference Architecture



Alexa – Creación de una Skill básica

- La creación de Skills para Alexa se realizará por medio de Amazon Developer Console
- Dentro de la cuenta debemos seleccionar la opción “Alexa Skills Kit”




Notifications

| All | Critical |
|-------------------|----------|
| No Notifications. | |

Announcements

| | | | |
|--|--------------|---|--------------|
| Build Alexa Skills for Customers in Italy and Spain | Jun 18, 2018 | Alexa and Echo Devices Now Available to Customers in France | Jun 5, 2018 |
| Announcing New Way to Improve AlexaSkill Discoverability and Enhance Customer Experience | May 30, 2018 | Developer Preview: Easily Use Amazon Polly Voices in Alexa Skills | May 16, 2018 |
| Build Games for Echo Buttons with the New Trivia Template | May 14, 2018 | Discover How Customers Engage With Your Alexa Skill Using Intent History In The Alexa Developer Console | May 10, 2018 |

Alexa – Creación de una Skill básica

 amazon alexa

Your Alexa Consoles

M ? 🔍

Feedback forum

Create a new skill

Next

Hello World Greeter

Skill created will default to [English \(US\)](#) ▾

Alexa – Creación de una Skill básica

The screenshot displays the Amazon Alexa Developer Console. The top navigation bar includes the 'amazon alexa' logo, a language dropdown set to 'English (U.S.)', and tabs for 'Your Skills', 'Hello World Greeter', 'Build', 'Test', 'Distribution', 'Certification', and 'Analytics'. The 'Build' tab is active. On the left sidebar, the 'Intents (4)' section is highlighted with a red box, showing a list of built-in intents: *AMAZON.FallbackIntent*, *AMAZON.CancelIntent*, *AMAZON.HelpIntent*, and *AMAZON.StopIntent*. The main content area is titled 'How to get started' and features a large 'amazon alexa Developer Console: Build' banner. Below this, there are sections for 'Resources' including 'Documentation', 'Sample Alexa Projects', 'Weekly Office Hours', and 'Alexa Developer Forums'. On the right, a 'Skill builder checklist' is shown with four steps, each marked as 'REQUIRED' and completed with a checkmark: 1. Invocation Name, 2. Intents, Samples, and Slots, 3. Build Model, and 4. Endpoint.

Alexa – Creación de una Skill básica

The image shows a composite of three screenshots from the Amazon Alexa Developer Console, illustrating the steps to create a new skill.

Top Screenshot: The main navigation bar at the top of the console. The 'Build' tab is selected. The left sidebar shows the 'Intents (4)' section highlighted with a red box, indicating the next step in the process.

Middle Screenshot: The 'Add Intent' page. The 'Create custom intent' radio button is selected. The text input field contains 'GreetHelloWorld'. The 'Create custom intent' button is highlighted with a red box, indicating the next step.

Bottom Screenshot: The 'Add Intent' page showing the 'Use an existing intent from Alexa's built-in library' option. The 'Search built-ins' field is visible, and a list of built-in intents is shown below, including 'Books' and 'Calendar'.

Left Sidebar (Common to all): The left sidebar shows the 'Intents (4)' section highlighted with a red box. Below it, the 'Built-In Intents (4)' section is visible, listing 'AMAZON.FallbackIntent', 'AMAZON.CancelIntent', 'AMAZON.HelpIntent', and 'AMAZON.StopIntent'. The 'Add' button is also visible.

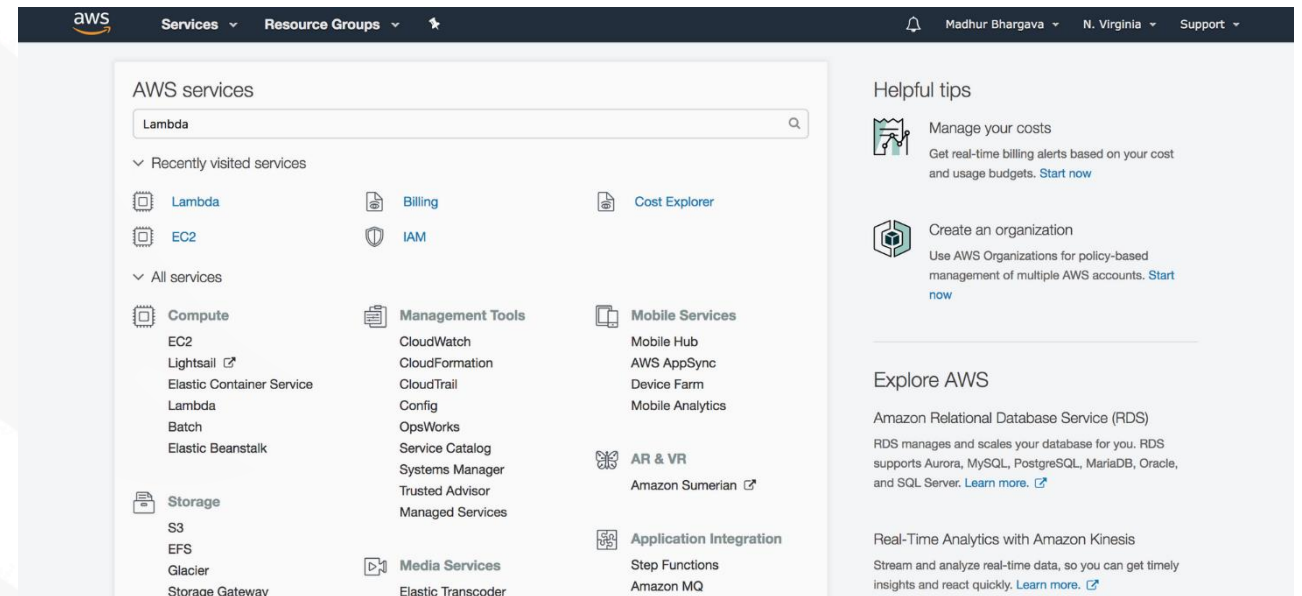
Alexa – Creación de una Skill básica

The image is a collage of four screenshots from the Amazon Alexa Developer Console, illustrating the process of creating a basic skill. The screenshots are overlaid, showing different stages of the setup.

- Top-left screenshot:** Shows the 'Build' tab of the console. The left sidebar has a red box around 'Intents (4)' with an '+ Add' button next to it. Below it, a list of built-in intents is visible: *AMAZON.FallbackIntent*, *AMAZON.CancelIntent*, *AMAZON.HelpIntent*, and *AMAZON.StopIntent*.
- Top-right screenshot:** Shows the 'Add Intent' screen. The 'Create custom intent' option is selected. A text box contains 'GreetHelloWorld'. Below this, a list of built-in intents is shown, with 'GreetHelloWorld' highlighted in a blue box.
- Bottom-left screenshot:** Shows the 'Intents / GreetHelloWorld' page. The 'Sample Utterances (5)' section is visible, showing a list of phrases that can trigger the intent: 'Say Hi', 'Say Hello', 'Say Hello World', 'Say Something', and 'Greet Us'. Each phrase has a delete icon.
- Bottom-right screenshot:** Shows the 'Intent Slots (0)' section. It displays a table with columns for 'ORDER', 'NAME', 'SLOT TYPE', and 'ACTIONS'. The first row shows '1' in the order column, 'Create a new slot' in the name column, and a '+ Add' button in the actions column. A dropdown menu for 'Select a slot type' is also visible.

Alexa – Creación de una Skill básica

- Para terminar de configurar la Skill para Alexa se realizará por medio de Amazon AWS
- Buscar el servicio “Lambda” y crear una función
 - Este servicio es el encargado de recibir las solicitudes de Alexa y responderlas



Alexa – Creación de una Skill básica

The screenshot shows the AWS Lambda console interface for creating a new function. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', 'Alexa for Business', and a user profile. The breadcrumb trail indicates the path: Lambda > Functions > Create function. The main heading is 'Create function'. There are three tabs: 'Author from scratch' (selected), 'Blueprints', and 'Serverless Application Repository'. The 'Author from scratch' tab contains a form with the following fields: 'Name' (greeterHelloWorldSkill), 'Runtime' (Node.js 8.10), 'Role' (Choose an existing role), and 'Existing role' (lambda_basic_execution). The 'Role' field has a dropdown menu. The 'Existing role' field has a text input. At the bottom right, there are 'Cancel' and 'Create function' buttons. The footer of the console shows the URL 'https://console.aws.amazon.com/console/home?region=us-e...' and copyright information.

aws Services Resource Groups Alexa for Business

Lambda > Functions > Create function

Create function

Author from scratch ☒ Start with a simple "hello world" example.

Blueprints ☐ Choose a preconfigured template as a starting point for your Lambda function.

Serverless Application Repository ☐ Find and deploy serverless apps published by developers, companies, and partners on AWS.

Author from scratch [Info](#)

Name
greeterHelloWorldSkill

Runtime
Node.js 8.10

Role
Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. [Learn more](#) about Lambda execution roles.
Choose an existing role

Existing role
You may use an existing role with this function. Note that the role must be assumable by Lambda and must have Cloudwatch Logs permissions.
lambda_basic_execution

Cancel Create function

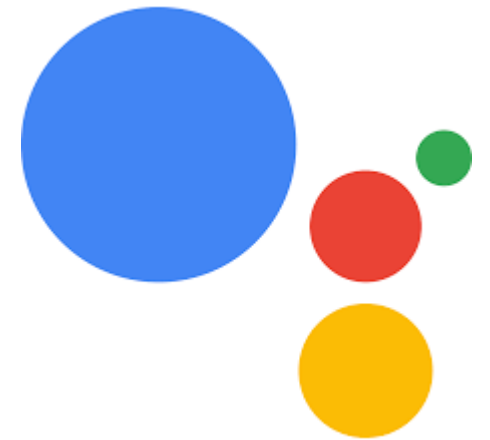
<https://console.aws.amazon.com/console/home?region=us-e...> © 2008 - 2018, Amazon Internet Services Private Ltd. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms of Use](#)

Alexa – Creación de una Skill básica

The screenshot displays the AWS Lambda console interface. At the top, the navigation bar includes the AWS logo, 'Services', 'Resource Groups', 'Alexa for Business', and a user profile. The breadcrumb trail shows 'Lambda > Functions > greeterHelloWorldSkill'. The function name 'greeterHello...' is partially visible, followed by buttons for 'Throttle', 'Qualifiers', 'Actions', a 'Select a test event..' dropdown, 'Test', and 'Save'. A green notification box states: 'Congratulations! Your Lambda function "greeterHelloWorldSkill" has been successfully created. You can now change its code and configuration. Click on the "Test" button to input a test event when you are ready to test your function.' Below this, the 'Configuration' tab is selected, showing the 'Designer' section. On the left, under 'Add triggers', a list includes 'API Gateway', 'AWS IoT', 'Alexa Skills Kit', 'Alexa Smart Home', and 'CloudFront'. The 'Alexa Skills Kit' trigger is highlighted with a blue box and the text 'Configuration required'. The main workspace shows a diagram with a key icon, a box labeled 'greeterHelloWorldSkill', and a dashed box containing the text 'Add triggers from the list on the left'. On the right, a list of services includes 'AWS Lambda', 'Amazon CloudWatch', and 'Amazon CloudWatch Logs'.

Google Assistant

- Asistente virtual (Google Allo) desarrollado por Google y presentado en 2016 para dispositivos Pixel y Pixel XL
- Actualmente está disponible para dispositivos Android y altavoces inteligentes
- Google ha anunciado que el asistente podrá interactuar con la cámara para reconocer objetos

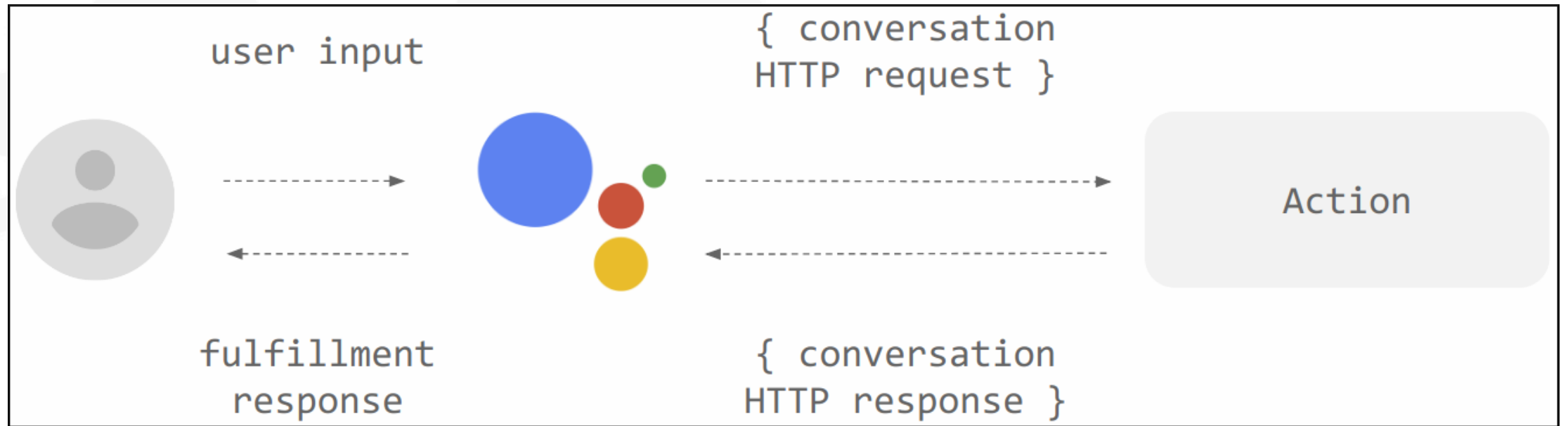


Google Assistant

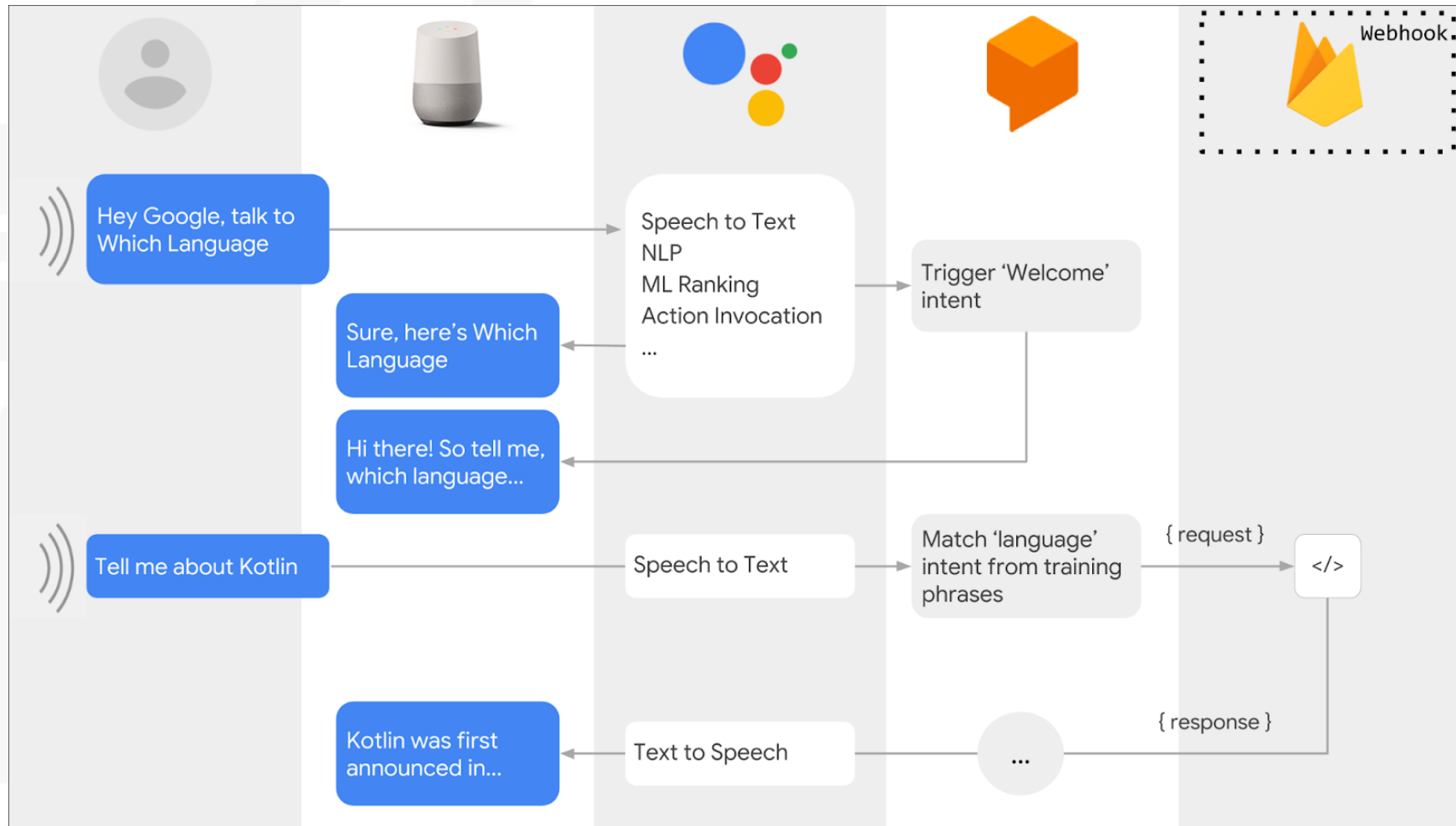
- Acciones posibles con Google Assistant:
 - Comandos por voz
 - Controlar la reproducción de música
 - Programar eventos
 - Contestar mensajes
 - Traducir textos en tiempo real
 - Multicuenta



Google Assistant - Arquitectura

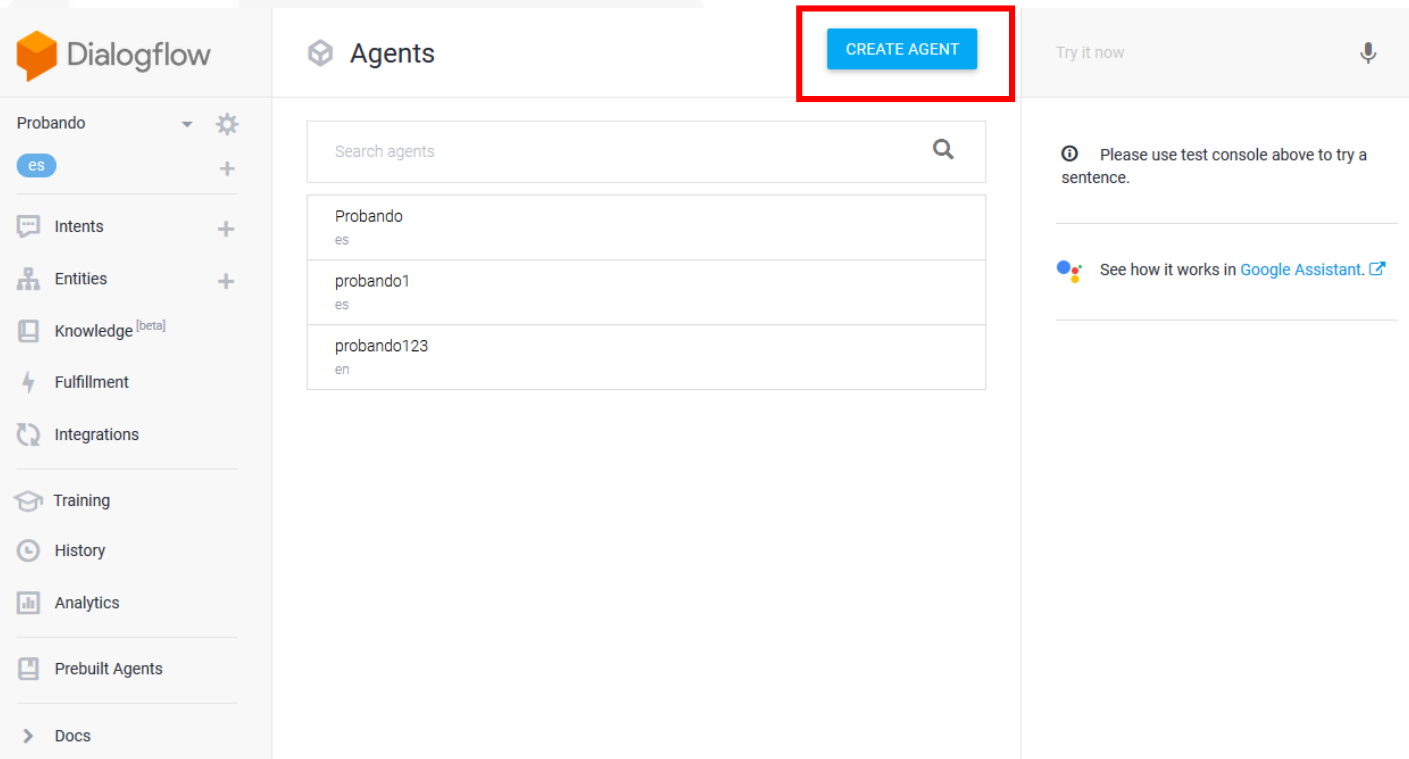


Google Assistant - Dialogflow





Google Assistant – Creación de una Skill básica


- Parar crear una skill necesitamos una cuenta de Gmail y acceder a la herramienta *Dialogflow* y crear un nuevo agente







Google Assistant – Creación de una Skill básica


 Dialogflow


Probando 


en 


 Intents 


 Entities 

 Knowledge ^[beta]


 Fulfillment


 Integrations

 Training

Agent name 


CREATE

DEFAULT LANGUAGE 

English — en 


Primary language for your agent. Other languages can be added later.

DEFAULT TIME ZONE

(GMT+2:00) Europe/Kaliningrad 

Date and time requests are resolved using this timezone.

GOOGLE PROJECT

Create a new Google project 

Enables Cloud functions, Actions on Google and permissions management.

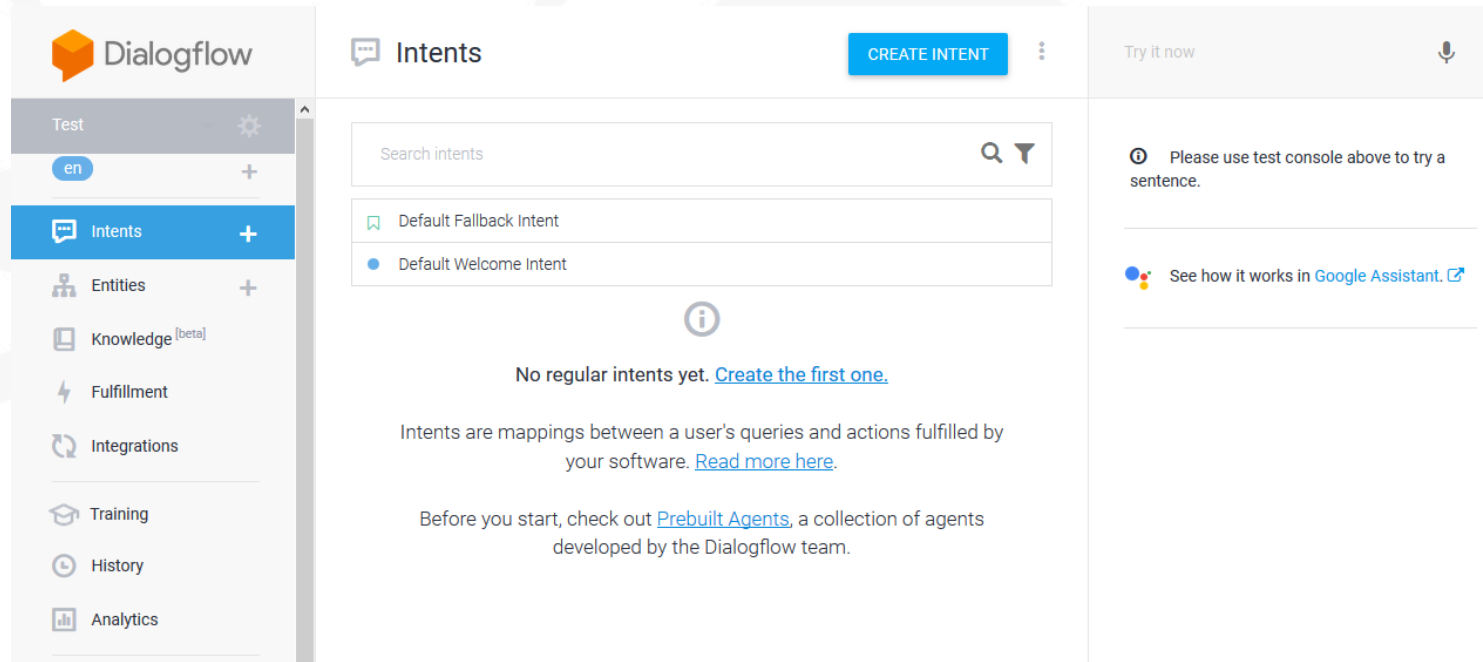
Try it now

 Please use test console above to try a sentence.

 Set-up [Google Assistant integration](#).

Google Assistant – Creación de una Skill básica

- El siguiente paso será crear los Intent con los que interactuar



Google Assistant – Creación de una Skill básica

- El siguiente paso será crear los Intent con los que interactuar

The screenshot shows the Dialogflow console interface for creating a skill. The left sidebar contains navigation links: Test, Intents (selected), Entities, Knowledge [beta], Fulfillment, Integrations, Training, History, and Analytics. The main content area is titled 'Intents' and features a 'CREATE INTENT' button. Below this, a list of intents is shown, including 'Default Fallback Intent' and 'Default Welcome Intent'. A message states: 'No regular intents yet. [Create the first one.](#)' followed by an explanation: 'Intents are mappings between a user's queries and actions fulfilled by your software. [Read more here.](#)' and a note: 'Before you start, check out [Prebuilt Agents](#), a collection of agents developed by the Dialogflow team.'

The 'Default Welcome Intent' configuration panel is open, showing sections for Contexts, Events, and Training phrases. The Events section includes a 'Welcome' event with an 'Add event' button. The Training phrases section lists several phrases: 'just going to say hi', 'heya', 'hello hi', 'howdy', 'hey there', 'hi there', 'greetings', and 'hey'. A 'SAVE' button is located at the top right of the configuration panel.

Google Assistant – Creación de una Skill básica

The screenshot displays the Google Assistant Actions Console Simulator. The top navigation bar includes 'Actions Console', 'Overview', 'Develop', 'Test' (selected), 'Deploy', and 'Analytics'. On the right, there are icons for 'Test', help, notifications, and a user profile 'A'.

The main area is titled 'Simulator'. On the left, a chat window titled 'my test app' shows a conversation:

- User: 'Talk to my test app' (button)
- Assistant: 'Alright. Let's get the test version of my test app. Hello! How can I help you?' (with speaker icon)
- User: 'Hello' (button)
- Assistant: 'Hello! How can I help you?' (with speaker icon)
- User: 'Hola' (button)
- Assistant: 'Ciao' (with speaker icon)
- User: 'Hola' (button with menu icon)
- Assistant: 'Aloha' (with speaker icon)

Below the chat is a 'Suggested input' section with a 'cancel' button, and an 'Input' section with a dropdown and the text 'Try typing or saying "Talk to my test app"'.

On the right, a 'Change version' panel shows settings for 'Surface' (Phone), 'Language' (English (United States)), and 'Location' (Googleplex, Mountain View, CA 94043, United States). Below this is a tabbed interface with 'DISPLAY', 'REQUEST', 'RESPONSE', 'AUDIO', 'DEBUG', and 'ERRORS'. The 'DISPLAY' tab is active, showing a visual representation of the chat window with the text 'my test app' and 'Aloha'.

Siri

- Es considerada la primera aplicación de asistente personal virtual
- Asistente virtual desarrollado por Siri venture group en 2008
- En 2010 se lanza una app para iPhone
- 2 meses después Apple compra Siri
- 2011 Siri es incorporada al iPhone 4S
- 2018 Apple lanza su altavoz inteligente Home pod

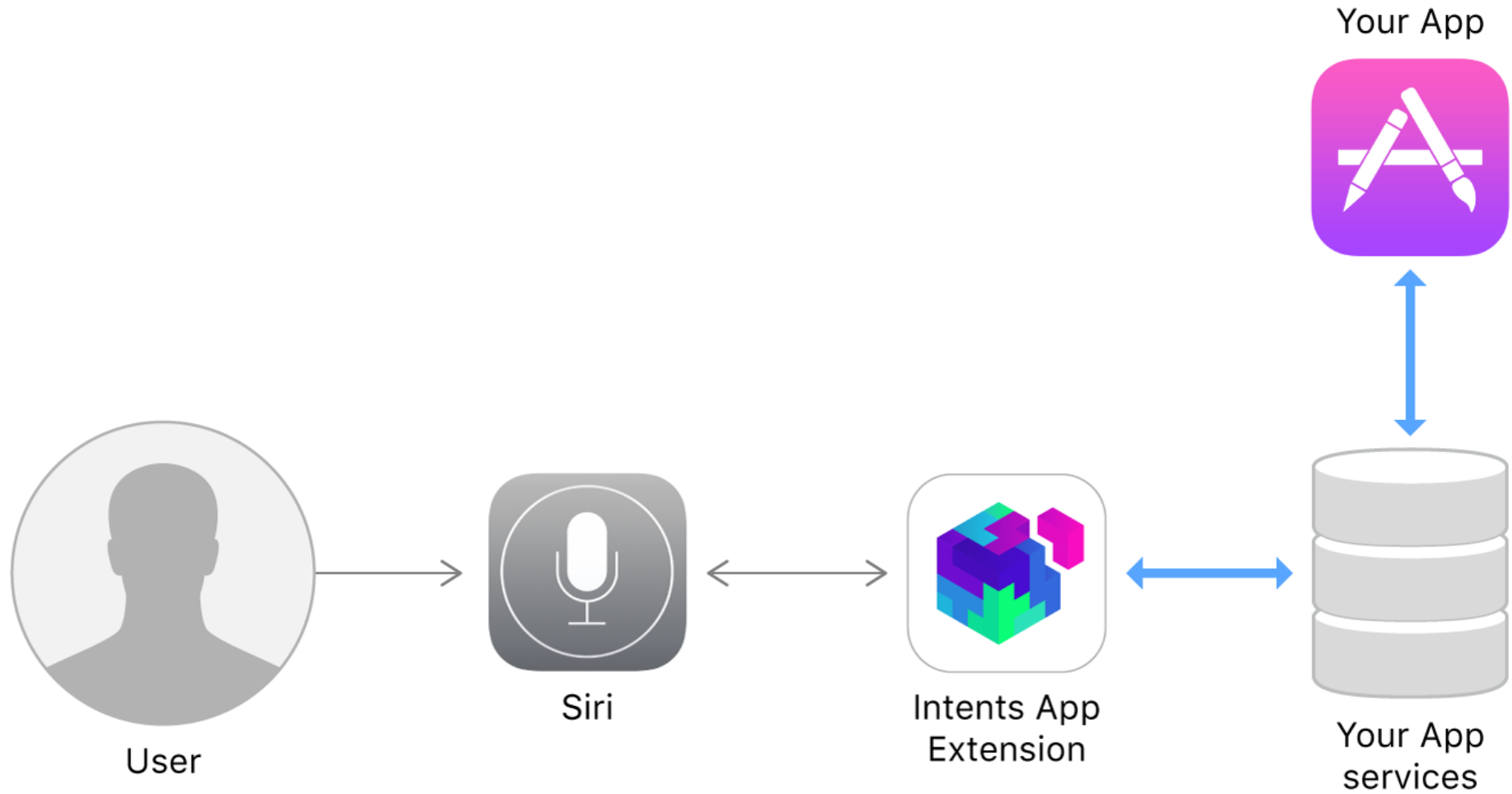


Siri

- Acciones posibles con Siri:
 - Comandos por voz
 - Creación de atajos personalizados para combinar acciones
 - Reproducir música a través de aplicaciones
 - Buscar ficheros dentro del dispositivo
 - Buscar contraseñas almacenadas en el dispositivo
 - Interactuar con las características del dispositivo
 - Interactuar con personas
 - Buscar información en Internet



Siri - Arquitectura



Otros asistentes

○ Bixby

- Asistente creado en 2017 por Samsung
- Disponible en algunos dispositivos Samsung



○ Braina

- Asistente virtual para ordenador
- Permite traducir a 100 idiomas



Otros asistentes

○ Voice Mate

- Asistente creado en 2017 por LG
- Disponible en algunos dispositivos LG
- Puede instalarse en otros dispositivos



○ J.A.R.V.I.S.

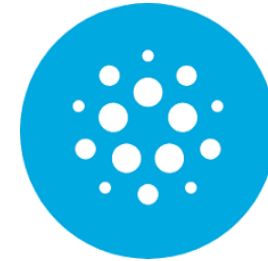
- Asistente virtual para el control de electrodomésticos inteligentes
- Disponible para descargar a dispositivos móviles



Otros asistentes

○ Aura

- Asistente desarrollado por Telefónica en 2017
- Orientado a la aplicación Movistar +
- Programado sobre los servicios Azure Machine Learning



○ Dueros

- Asistente virtual desarrollado por Baidu's
- Disponible para dispositivos Android
- Gran popularidad en China



Comparativa entre Asistentes Virtuales

Query Results

| | Answered Correctly | Understood Query |
|------------------|--------------------|------------------|
| Google Assistant | 87.9% | 100% |
| Siri | 74.6% | 99.6% |
| Alexa | 72.5% | 99.0% |
| Cortana | 63.4% | 99.4% |



Comparativa entre Asistentes Virtuales

Queries Answered Correctly by Category

