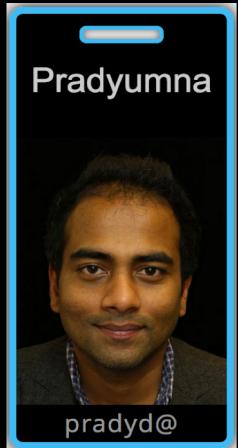


Build Your Own Chatbot (BYOC)



Pradyumna Dash("Prady")

Solutions Architect, Amazon Web Services

15 years infrastructure experience

11 years systems and solutions architecture experience

Passionate on DevOps, Container, Microservices, AI/ML

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Voice Is the Future

“The age of touch could soon come to an end. From smartphones and smartwatches, to home devices, to in-car infotainment systems, touch is no longer the primary user interface.”

Agenda

Why did we build Amazon Lex?

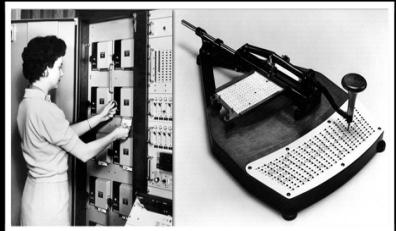
What is Amazon Lex and Polly?

How do I build conversational apps using Amazon Lex?

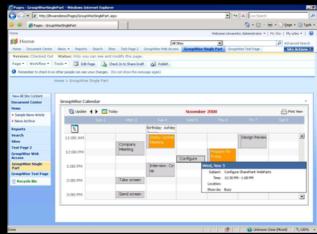
Demo

Q&A

Advent of conversational interactions



1st Gen:
Punch Cards & Memory Registers



2nd Gen:
Pointers & Sliders



3rd Gen:
Conversational Interfaces

Developer challenges

Security

Speech
Recognition

Disparate
Systems

Availability

Language
Understanding

Scale

Authentication

Messaging
platforms

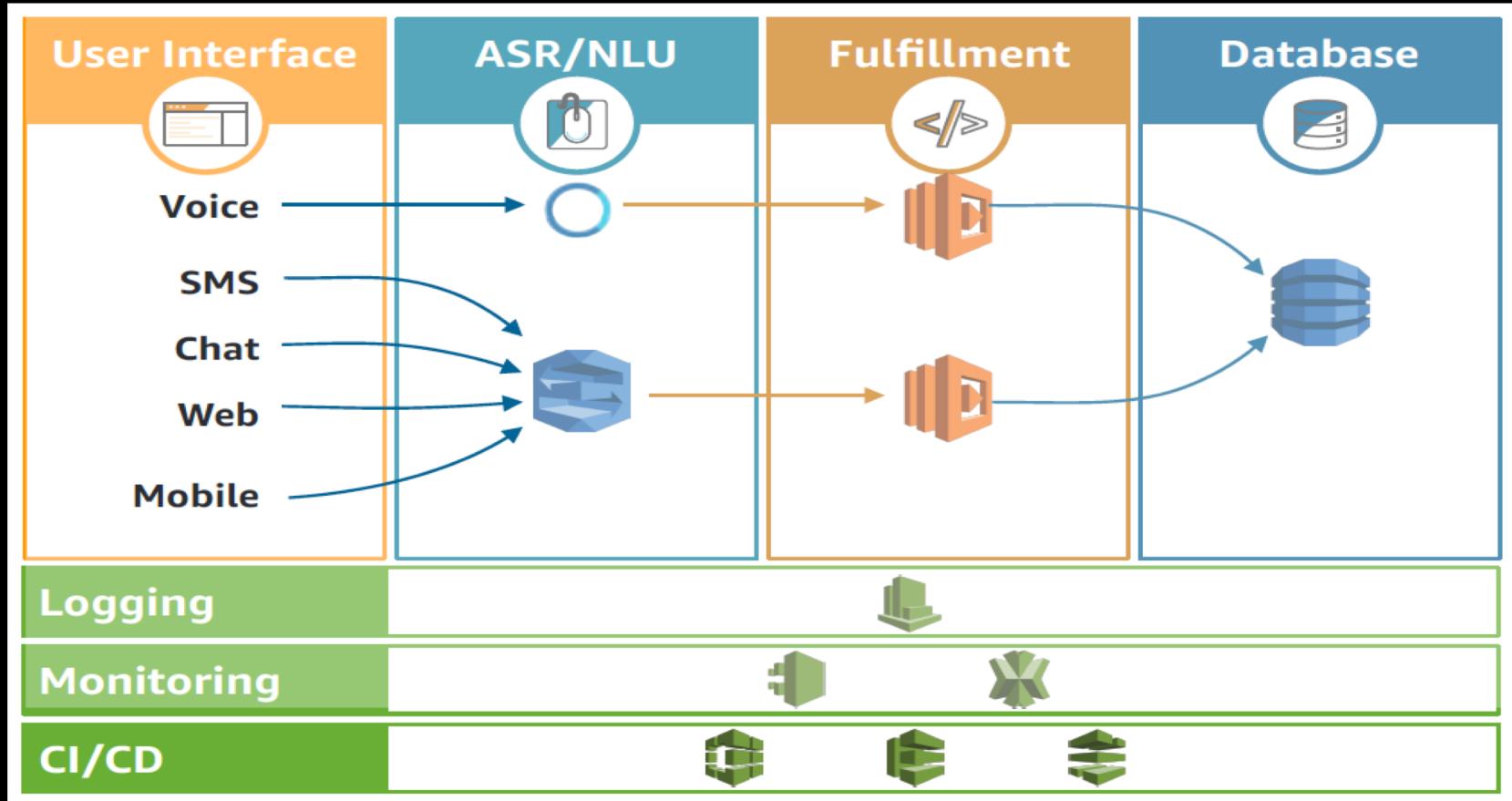
Business Logic

Mobile

Testing

Conversational interfaces need to combine a large number of sophisticated algorithms and technologies

Chatbot Architecture



Voice Services on AWS



Amazon Polly

Text-to-Speech



Amazon Lex

ASR & NLU

What is Amazon Polly?

- A service that converts text into lifelike speech
- Offers 47 lifelike voices across 24 languages
- Low latency responses enable developers to build real-time systems
- Developers can store, replay and distribute generated speech

“Today in Seattle, WA it’s
11°F”



Amazon Polly



“Today in Seattle Washington it’s 11 degrees Fahrenheit”



Amazon Polly: Quality

Natural sounding speech

A subjective measure of how close TTS output is to human speech.



Accurate text processing

Ability of the system to interpret common text formats such as abbreviations, numerical sequences, homographs etc.

Today in Las Vegas, NV it's 54°F.



"We live for the music", live from the Madison Square Garden.



Highly intelligible

A measure of how comprehensible speech is.

"Peter Piper picked a peck of pickled peppers."



Amazon Polly is cost-effective



- Pay-as-You-go
- \$4 for 1M characters
- Free Tier of 5M characters/month - first year
- You can store and reuse generated speech

RNIB provides the largest library in the UK for People with sight loss

“ Amazon Polly delivers incredibly lifelike voices which captivate and engage our readers.

”

John Worsfold

Solutions Implementation Manager, RNIB



Royal National Institute of Blind People creates and distributes accessible information in the form of synthesized content

- RNIB delivers largest library of audiobooks in the UK for nearly 2 million people with sight loss
- Naturalness of generated speech is critical to captivate and engage readers
- No restrictions on speech redistributions enables RNIB to create and distribute accessible information in a form of synthesized content

Duolingo voices its language learning service Using Amazon Polly

“ With Amazon Polly our users benefit from the most lifelike Text-to-Speech voices available on the market.

”

Severin Hacker
CTO, Duolingo



- Spoken language crucial for language learning
- Accurate pronunciation matters
- Faster iteration thanks to TTS
- As good as natural human speech

Duolingo is a free language learning service where users help translate the web and rate translations.

With Amazon Polly, GoAnimate gives voice to the characters in their animations

“ Amazon Polly gives GoAnimate users the ability to immediately give voice to the characters they animate using our platform.

Alvin Hung
CEO, GoAnimate **”**

GoAnimate

GoAnimate is a cloud-based, animated video creation platform.

- Multi-language communication
 - Training or HR professionals who have to create content in many languages
- Video preproduction
 - Video makers who need to iterate and fine-tune before the text-to-speech is eventually replaced by a professional voiceover
- K-12 education
 - Students who make videos and don't have access to professional voices or time for or knowledge of voiceover

Voice Services on AWS



Amazon Polly

Text-to-Speech

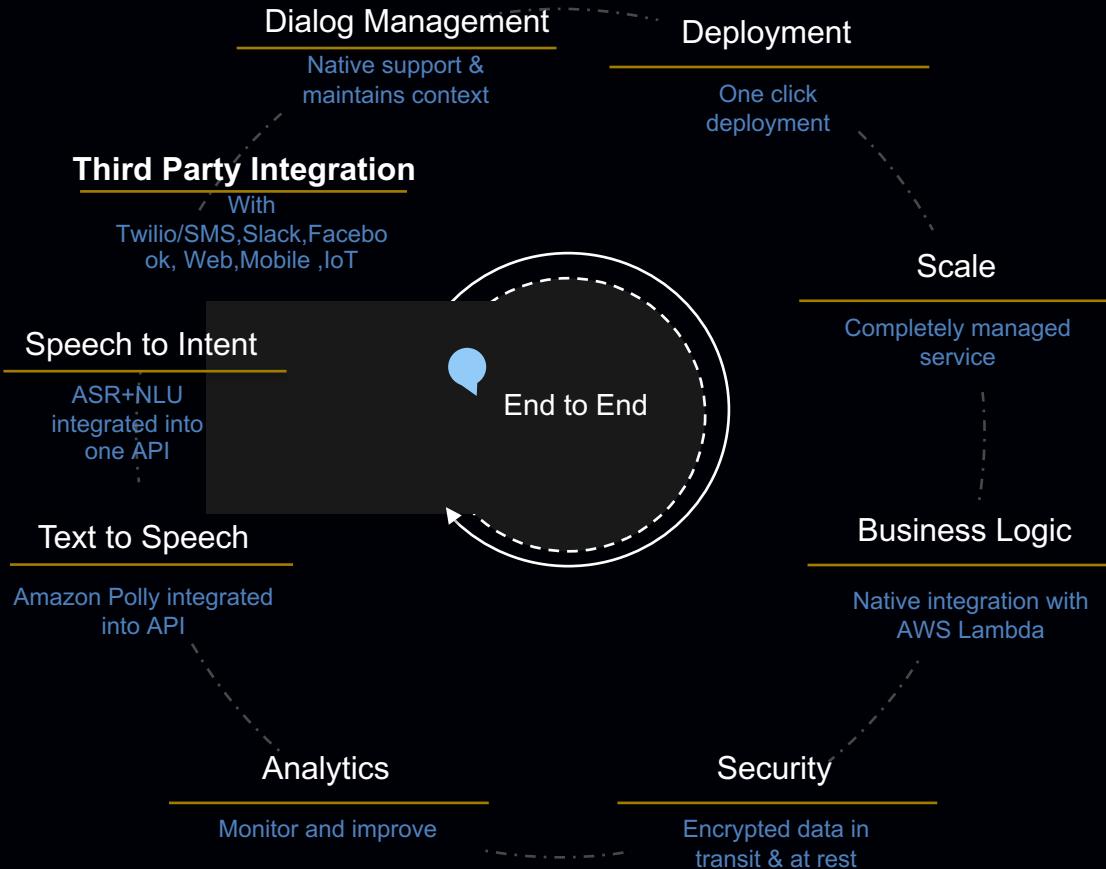


Amazon Lex

ASR & NLU

Amazon Lex:
A new service for building
conversational interfaces
using voice and text

Complete solution



Versioning and Alias support



Continuous learning

Improve

Add to intent



Analyze

Missed utterances



Monitor

AWS CloudWatch metrics



Amazon Lex - Features



Text and speech language understanding: powered by the same technology as Alexa



Deployment to chat services



Designed for builders: efficient and intuitive tools to build conversations; scales automatically



Versioning and alias support



Enterprise SaaS connectors: connect to enterprise systems

Amazon Lex – Use Cases



Informational Bots

Chatbots for everyday consumer requests

- News updates
- Weather information
- Game scores



Application Bots

Build powerful interfaces to mobile applications

- Book tickets
- Order food
- Manage bank accounts



Enterprise Productivity Bots

Streamline enterprise work activities and improve efficiencies

- Check sales numbers
- Marketing performance
- Inventory status



Internet of Things (IoT) Bots

Enable conversational interfaces for device interactions

- Wearables
- Appliances
- Auto



Popular Bots

Employee support (help desk)



DevOps admin (deployment)



Customer service (contact center)



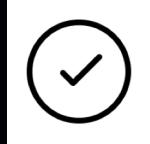
Executive assistant (business intelligence)



Student Experience



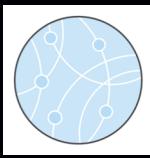
Amazon Lex Benefits



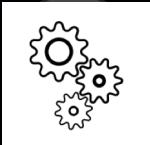
Easy to use



High quality text and speech language understanding



Seamlessly deploy and scale



Built-in integration with the AWS platform

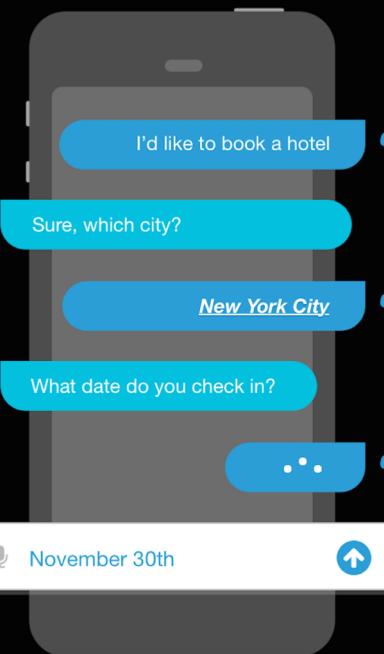


Cost effective

**How do I build conversational apps
using Amazon Lex?**

Amazon Lex

BookHotel



Intents

An Intent performs an action in response to natural language user input

Utterances

Spoken or typed phrases that invoke your intent

Slots

Slots are input data required to fulfill the intent

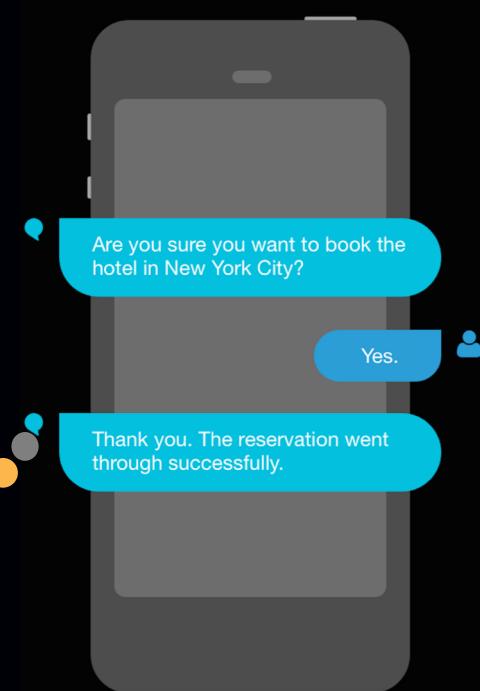
Fulfillment

Fulfillment mechanism for your intent

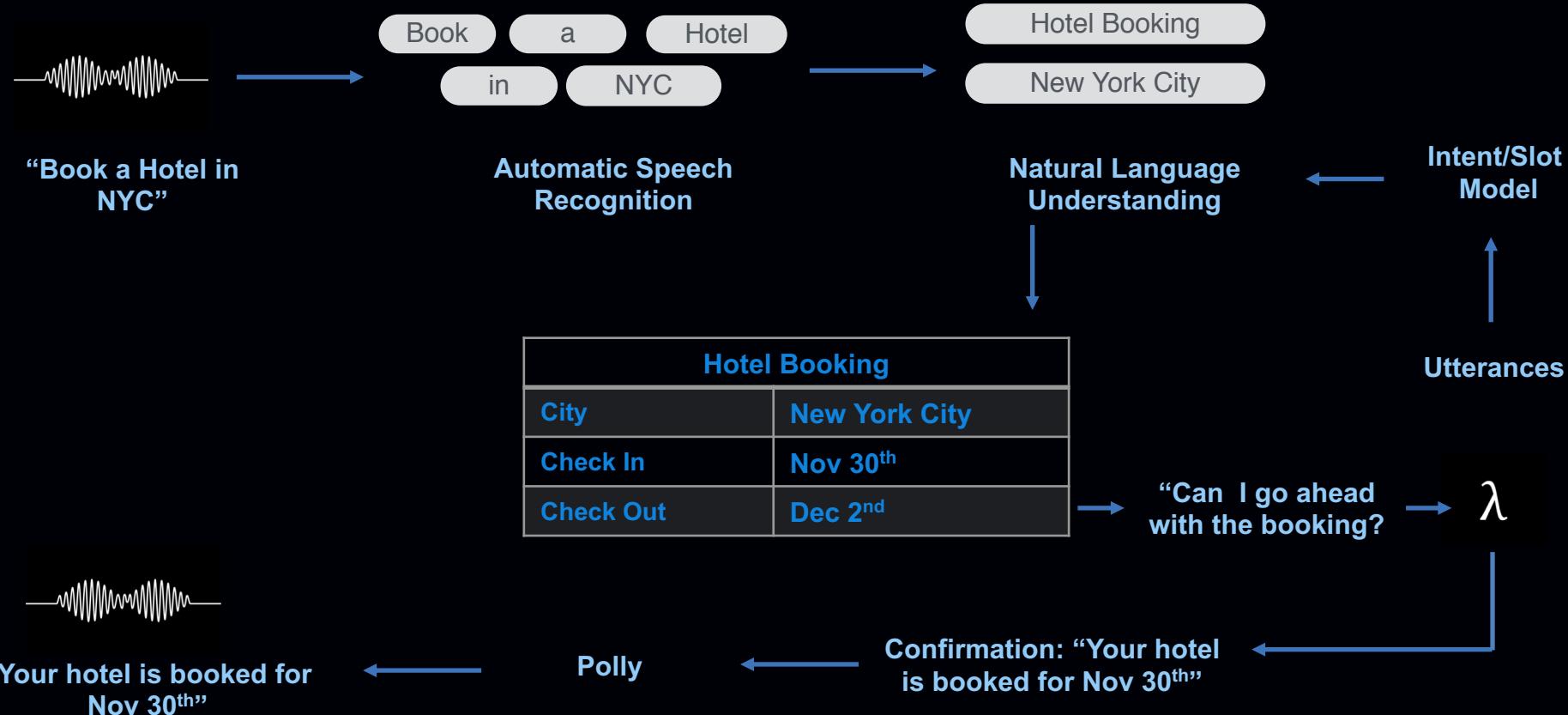
Are you sure you want to book the hotel in New York City?

Yes.

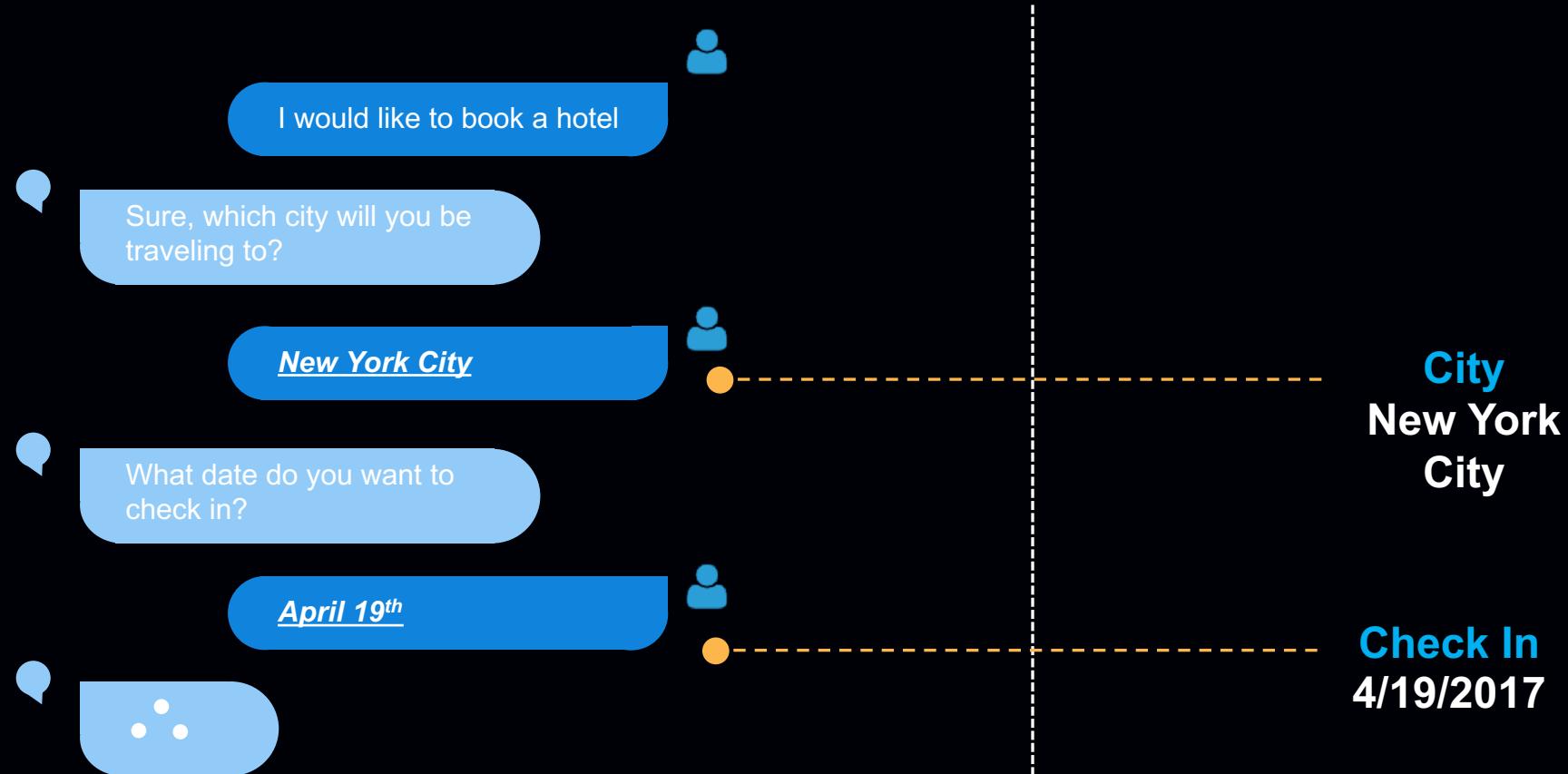
Thank you. The reservation went through successfully.



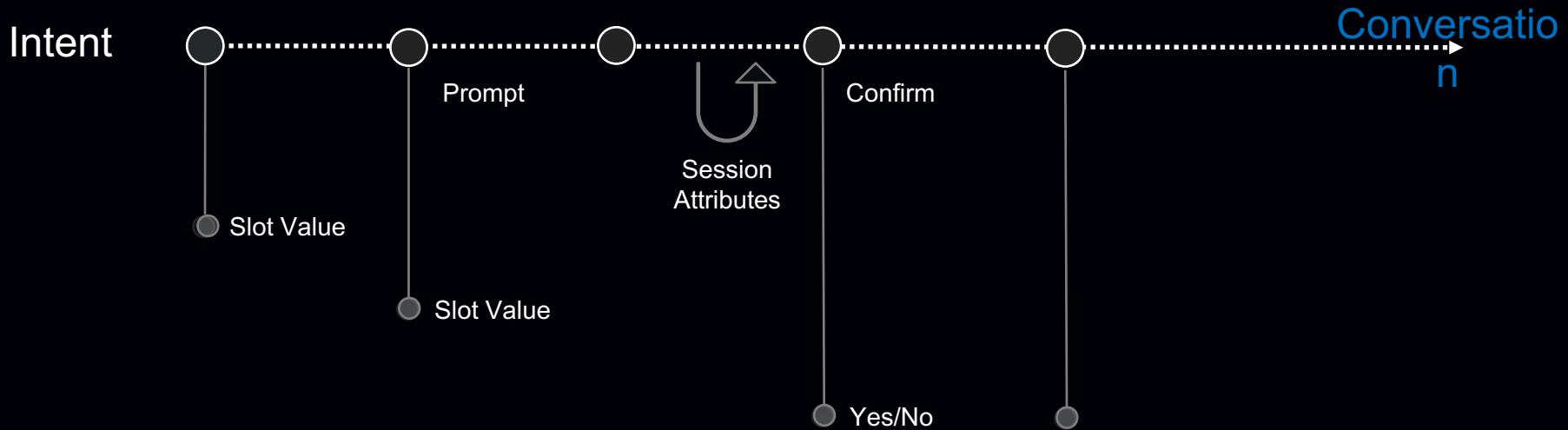
“Book a Hotel”



Slot elicitation



Conversation context



Lex maintains context by storing data throughout the conversation

Slot Values

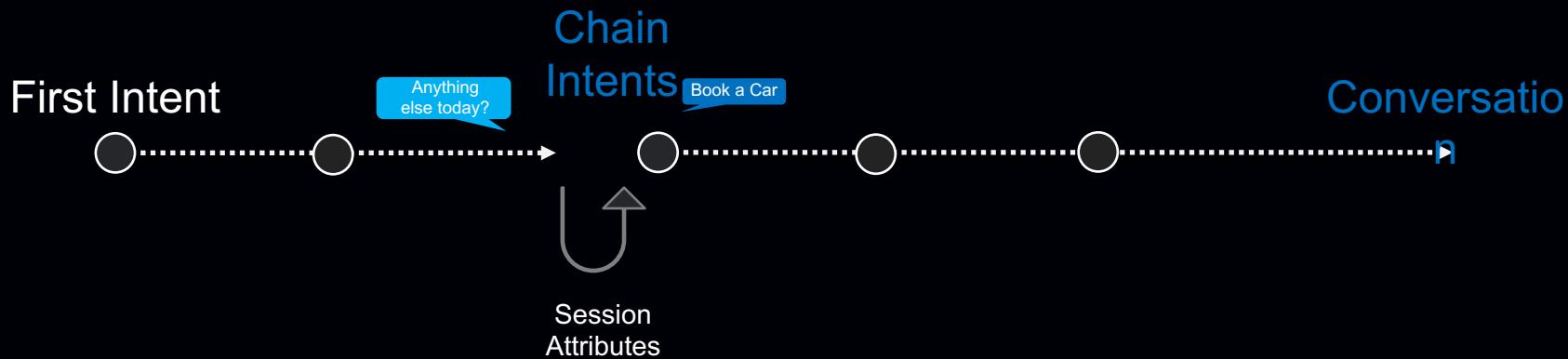
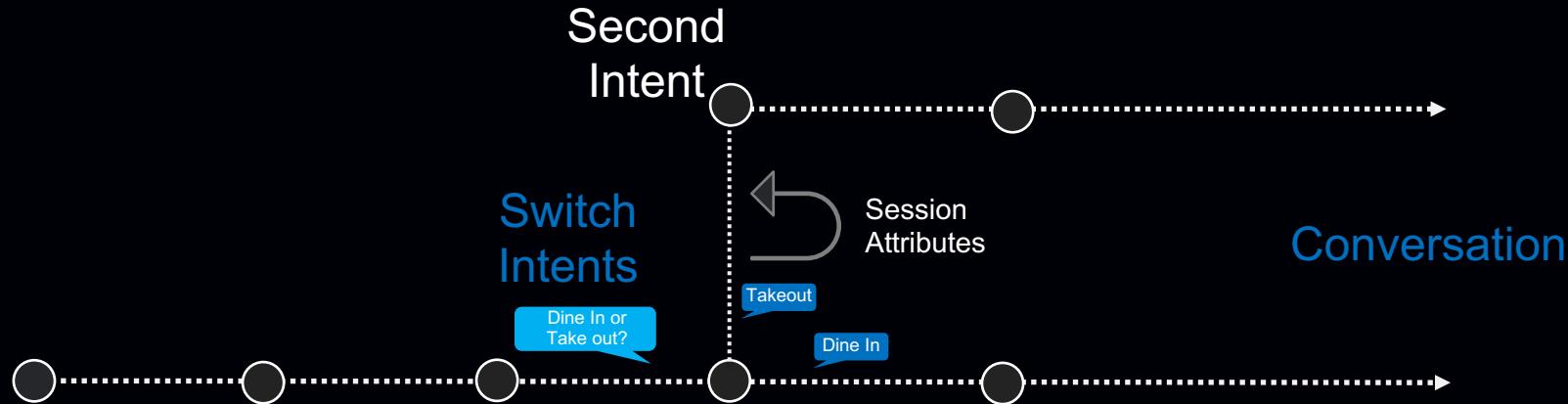
Intents

Prompts

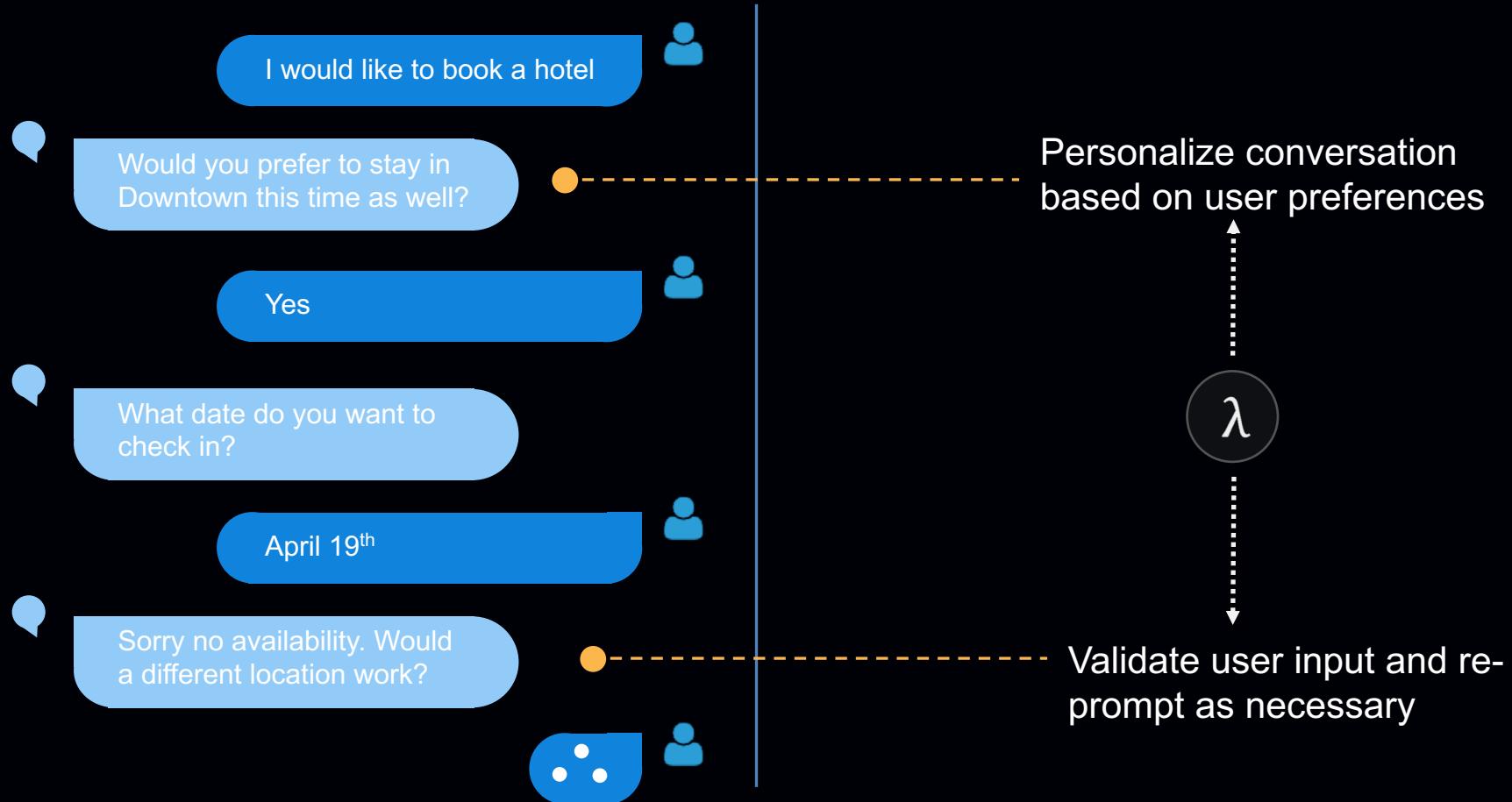
Session Attributes

Confirmations

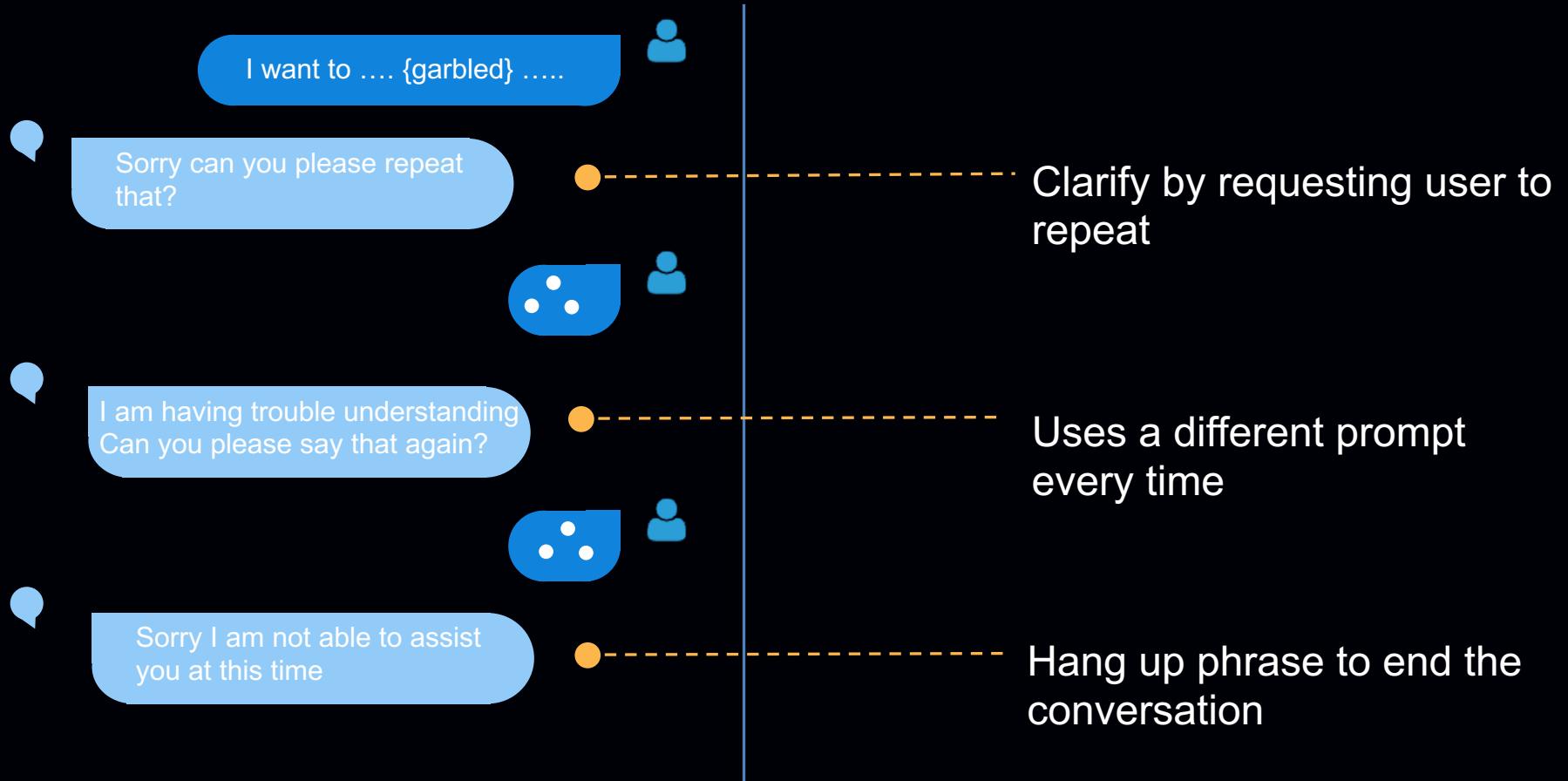
Dynamic conversation flow



Customize conversations



Error handling



Rich message formatting

A messaging interface illustrating rich message formatting. On the left, a blue speech bubble contains the text "I would like to rent a car". To its right is a small blue user icon. Below it, a light blue speech bubble contains the text "Sure. What type of car are you looking for?". At the bottom, there is a card displaying three car options: "Compact" (red hatchback), "Mid-Size" (silver hatchback), and "Luxury" (orange coupe). Each option includes a price ("\$9.99 per day", "\$29.99 per day", "\$49.99 per day") and a "Select" button. The "Select" button for the Compact car is highlighted with a cursor icon. At the very bottom, a white bar contains a microphone icon, the word "Compact", and a blue up arrow icon.

- Formatted for messaging platforms
- Multiple cards supported
- Preview capability
- Test in console

Fulfillment



Intents and slots passed
to AWS Lambda function
for business logic
implementation

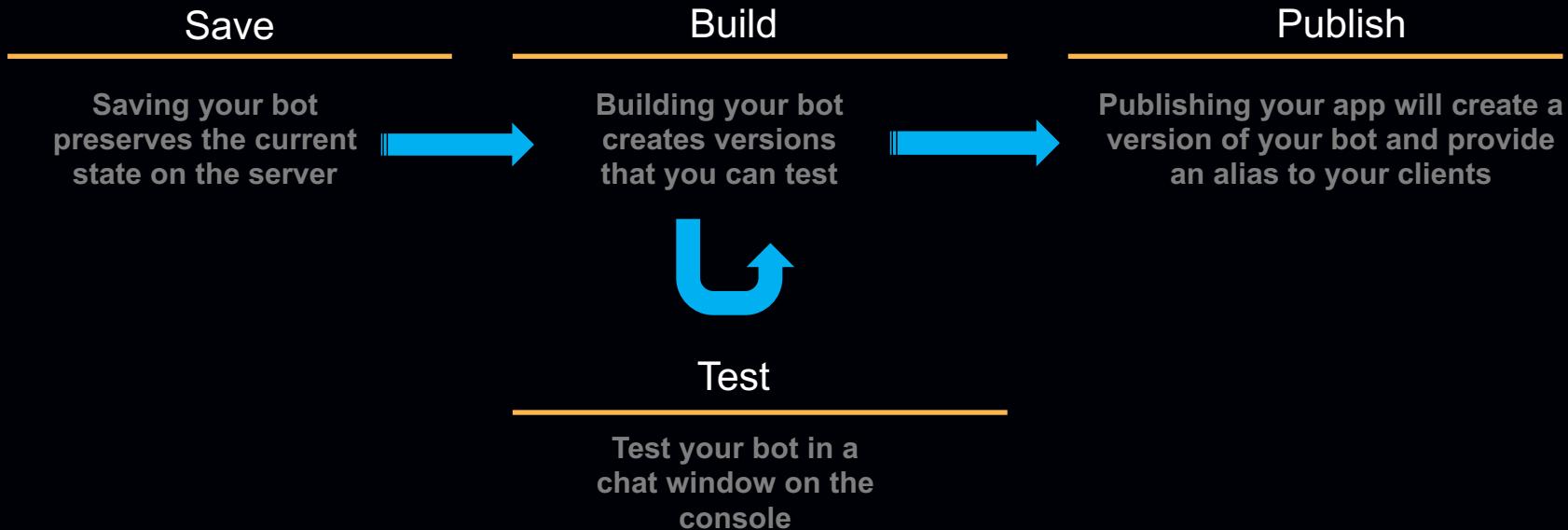
**AWS Lambda
Integration**



User input parsed to derive
intents and slot values.
Output returned to client
for further processing

**Return to
Client**

Save, build and publish



Amazon Lex pricing

	<u>Text</u>	<u>Speech</u>
Price per 1000 requests	\$0.75	\$4.00
Free Tier* (requests per month)	10,000	5,000

*Available for the first year upon sign-up to new Amazon Lex customers

Amazon Lex Customers





The Alexa Service

Supported by two powerful frameworks that leverage open APIs





Alexa Skills Kit (ASK)

ASK is a collection of self-service APIs, tools, documentation, and code samples that make it fast and easy for you to add skills to Alexa, including custom skills for your device.





Alexa Voice Service (AVS)

AVS is Amazon's cloud-based voice service that allows you as a developer to voice-enable any connected product that has a microphone and speaker.



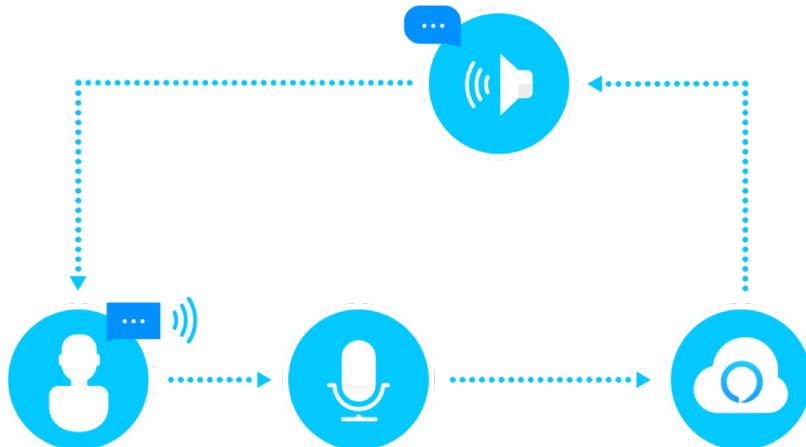
Natural voice control



Always getting smarter



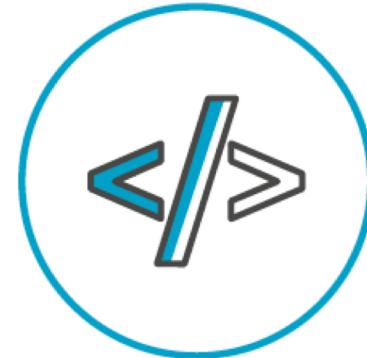
Easy to integrate, free to use



Two Sides of an Alexa Skill



+



Voice User
Interface

developer.amazon.com

Programming
Logic

aws.amazon.com

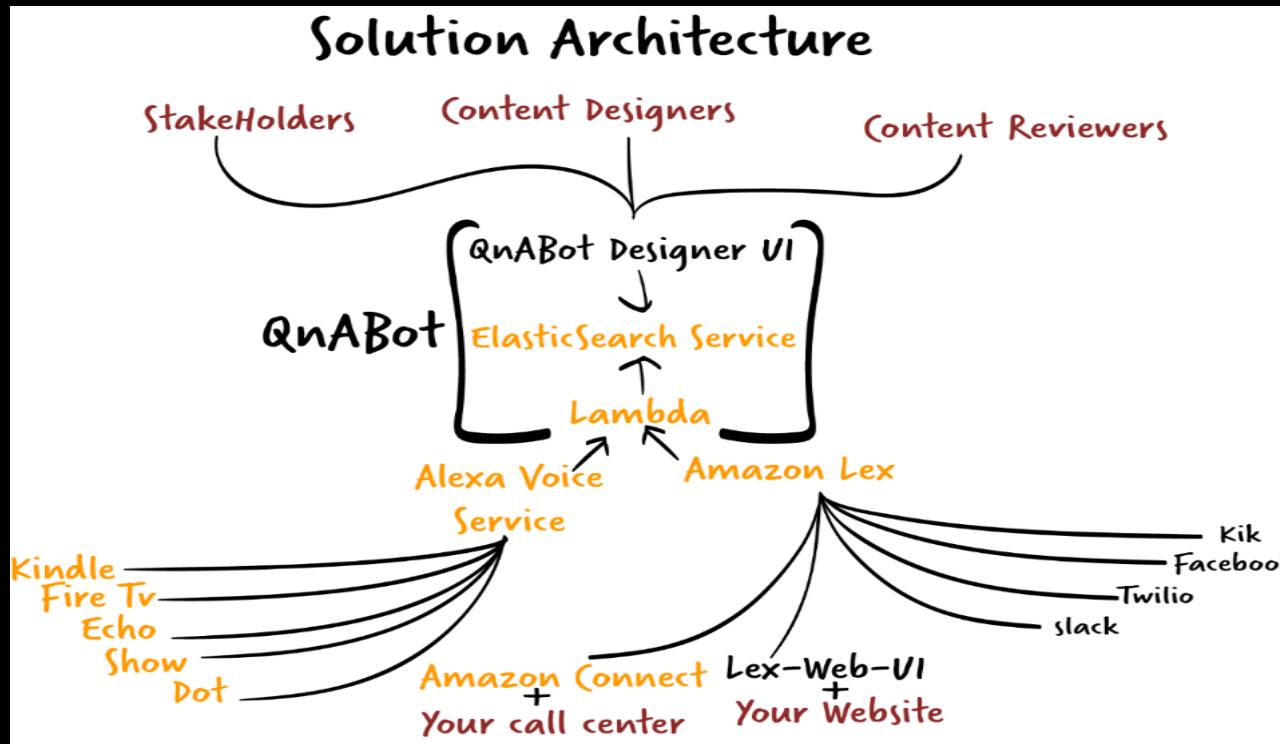
What is QnABot?

QnABot uses Amazon **Lex** and Amazon **Alexa** to provide a natural language interface to a “Question and Answer” knowledge base, so your users can just ask their questions and get quick and relevant answers.

Blog: www.amazon.com/qnabot

GitHub: <https://github.com/awslabs/aws-ai-qna-bot>

Concept: A room with many doors



When to use QnABot

When your customer wants to automate answering natural language questions. From content, they control (using many ‘doors’):

- Text chat and/or voice on their website, or 3rd party messaging app
- Alexa
- or their Amazon Connect call center

The QnABot is easy and quick to install and use. AWS expertise is not required.

It is not perfect (of course), but the code is open so we invite everyone to help make it better. Some community members have sent us pull requests, and we love that!

QnABot Architecture



- Integrated with [Facebook Messenger](#)
- Integrated with [Twilio SMS \[023 9316 2203\]](#)
- Integrated with [Amazon Connect \(Cloud based contact Center\) \[+44 20 3917 4651\]](#)
- Integrated with [Alexa](#)

Q & A

Thank You