

Build Your Own Chatbot

Arun Gupta, @arungupta
Amazon Web Services

Docker Captain
Java Champion
JavaOne Rock Star (4 years)
NetBeans Dream Team
Silicon Valley JUG Leader
Author
Runner
Lifelong learner



Tell me a Yoda quote

Developer Challenges

**Automated
Speech
Recognition**

Testing

Availability

Mobile

**Natural
Language
Understanding**

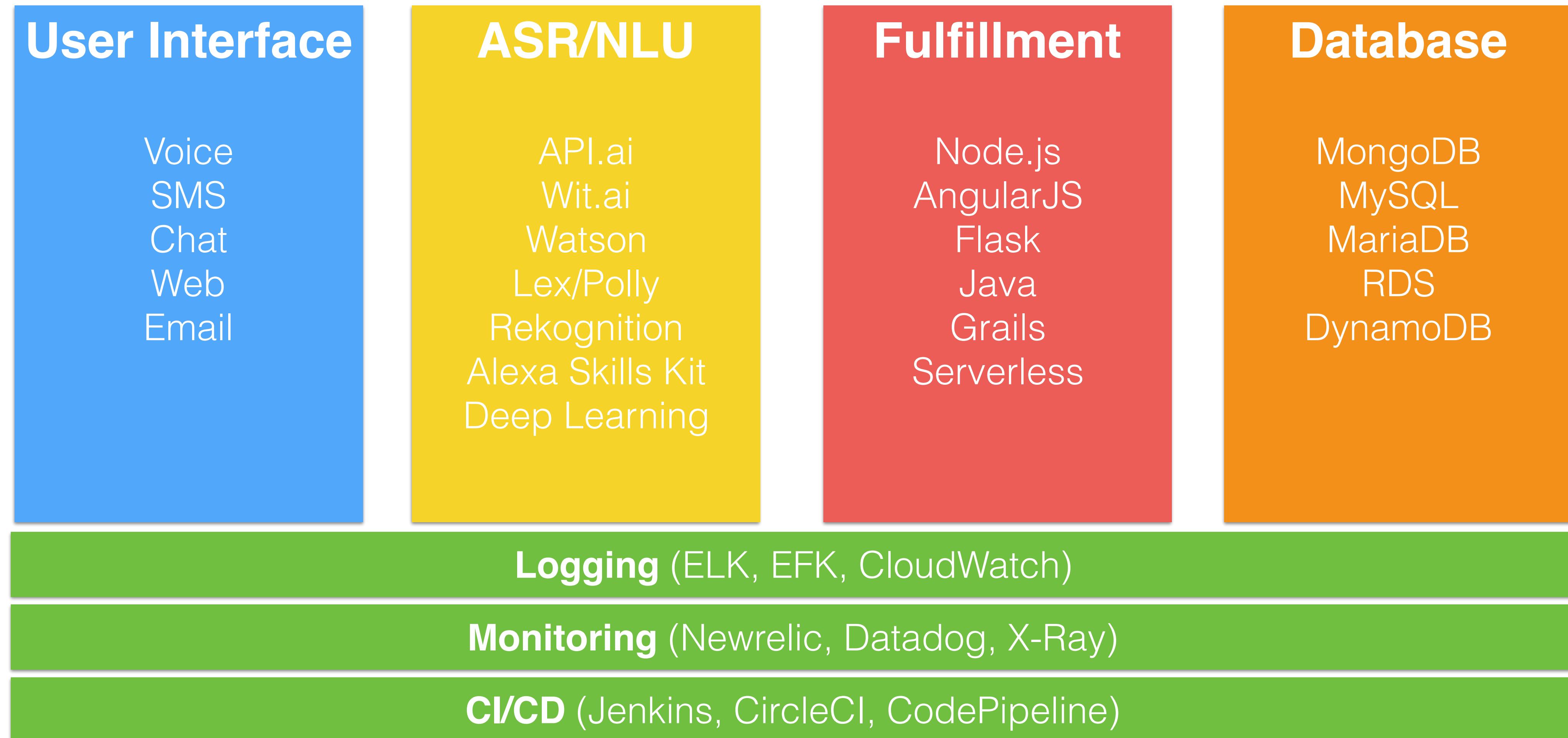
**Business
Logic**

Authentication

Scalability

**Disparate
Systems**

Chatbot Components



BookHotel

Intents

A particular goal that the user wants to achieve

I'd like to book a hotel.

Utterances

Spoken or typed phrases that invoke your intent

Sure, which city?

New York City

Slots

Data the user must provide to fulfill the intent

What date do you check in?

Prompts

Questions that ask the user to input data

...

Fulfillment

The business logic required to fulfill the user's intent



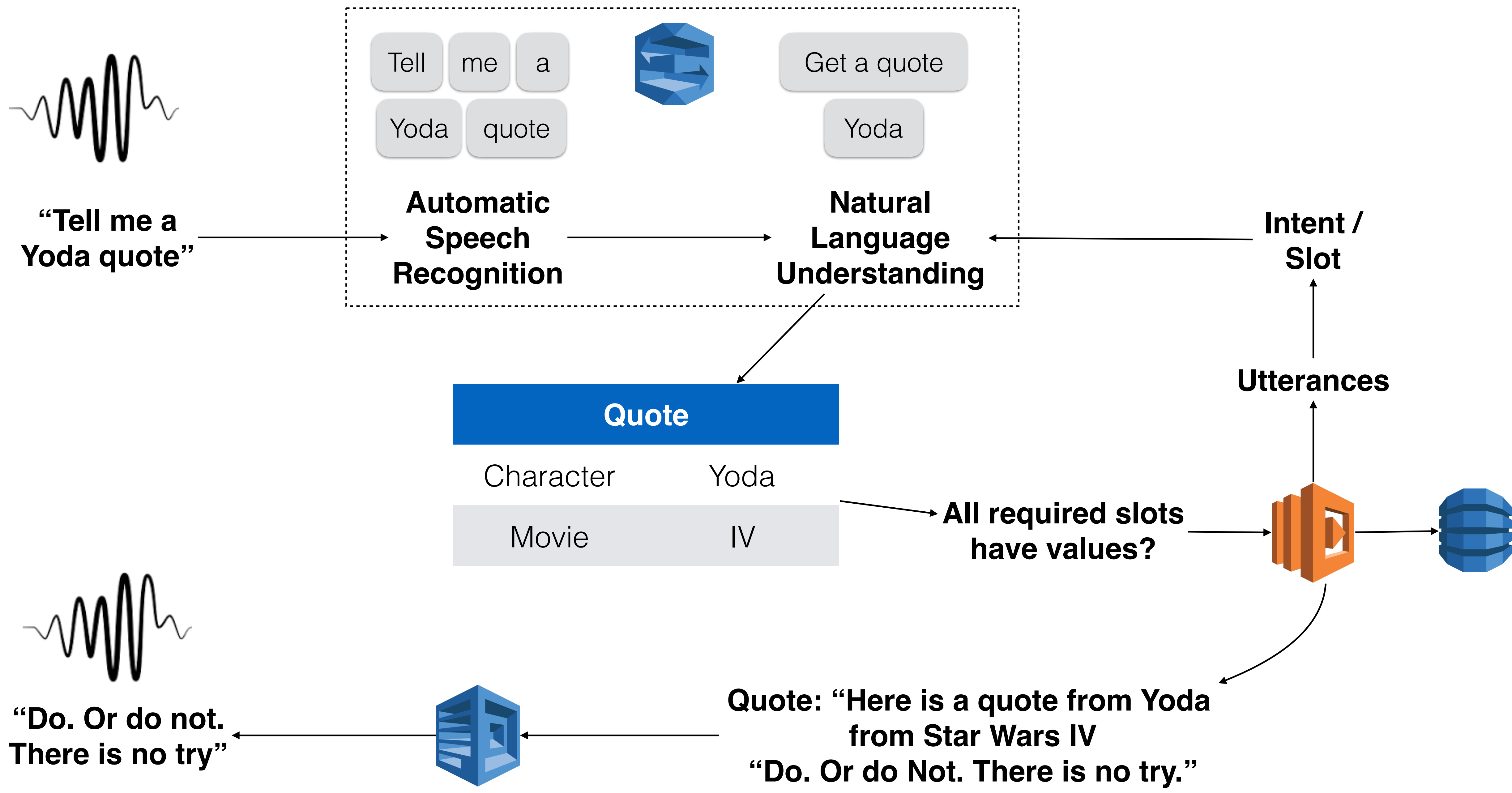
November 30th.



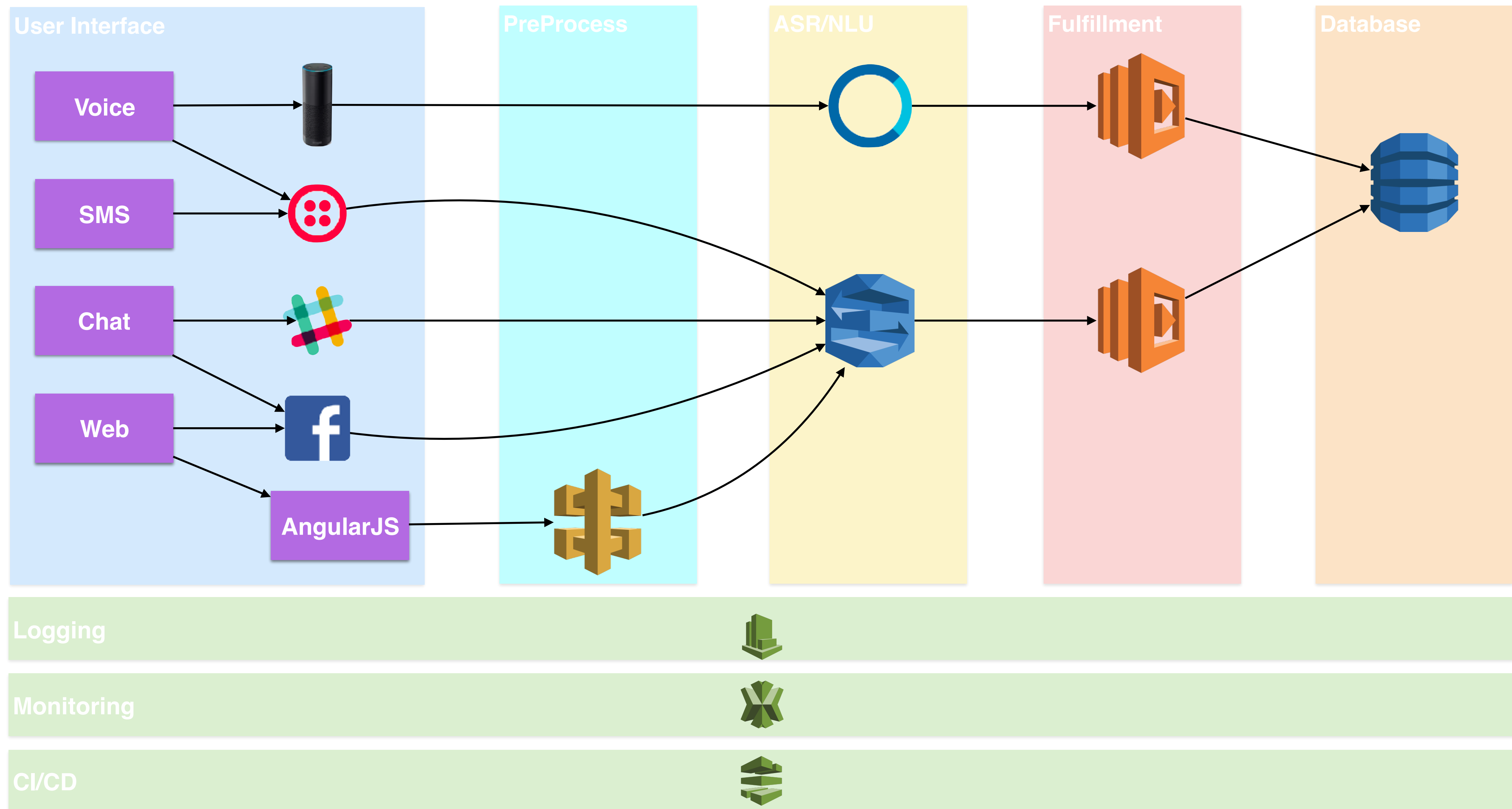
Are you sure you want to book the hotel in New York City?

Yes.

Thank you. The reservation went through successfully.



Chatbot Architecture



BYOC: Build Your Own Chatbot

■ Prepare database

- Add documents to DynamoDB, setup indexes

■ Build a Lex bot

- Define utterances, slots, slot-types, prompts, intent
- Write Lambda function for business logic (intent -> database)
- Integrate with Twilio, Slack, Facebook, Web, mobile



■ Build an Alexa skill (optional)

- Export Lex bot configuration for Alexa Skills Kit
- Write Lambda function for business logic (intent -> database)

BYOC #1: Prepare database

```
{
  "dead": true,
  "force-sensitive": true,
  "forceside": "light",
  "id": 1,
  "lightsaber": "green",
  "planet": "Dagobah",
  "quotes": [
    "When nine hundred years old you reach, look as good you will not.",
    "Truly wonderful, the mind of a child is",
    "A Jedi uses the Force for knowledge and defense, never for attack",
    "That is why you fail.",
    "Adventure. Excitement. A Jedi craves not these things.",
    "Judge me by my size, do you?",
    "Fear is the path to the dark side",
    "Wars not make one great",
    "Do, or do not. There is no try",
    "Size matters not",
    "The dark side clouds everything",
    "Impossible to see the future is",
    "Clear your mind must be",
    "Much to learn you still have ... my old padawan"
  ],
  "weapon": "lightsaber",
  "whoami": "Yoda"
}
```

BYOC #2: Build a Lex bot

 Services ▾ Resource Groups ▾ 

Lex

Bots

Intents

Slot types

Bots

Create

Actions ▾

Filter:

	Name	Status	Last updated
<input type="radio"/>	OrderFlowers	READY	September 3, 2017 at 6:59:18 PM UTC+2
<input type="radio"/>	StarWars	READY	September 9, 2017 at 3:31:22 AM UTC+2

Amazon Lex



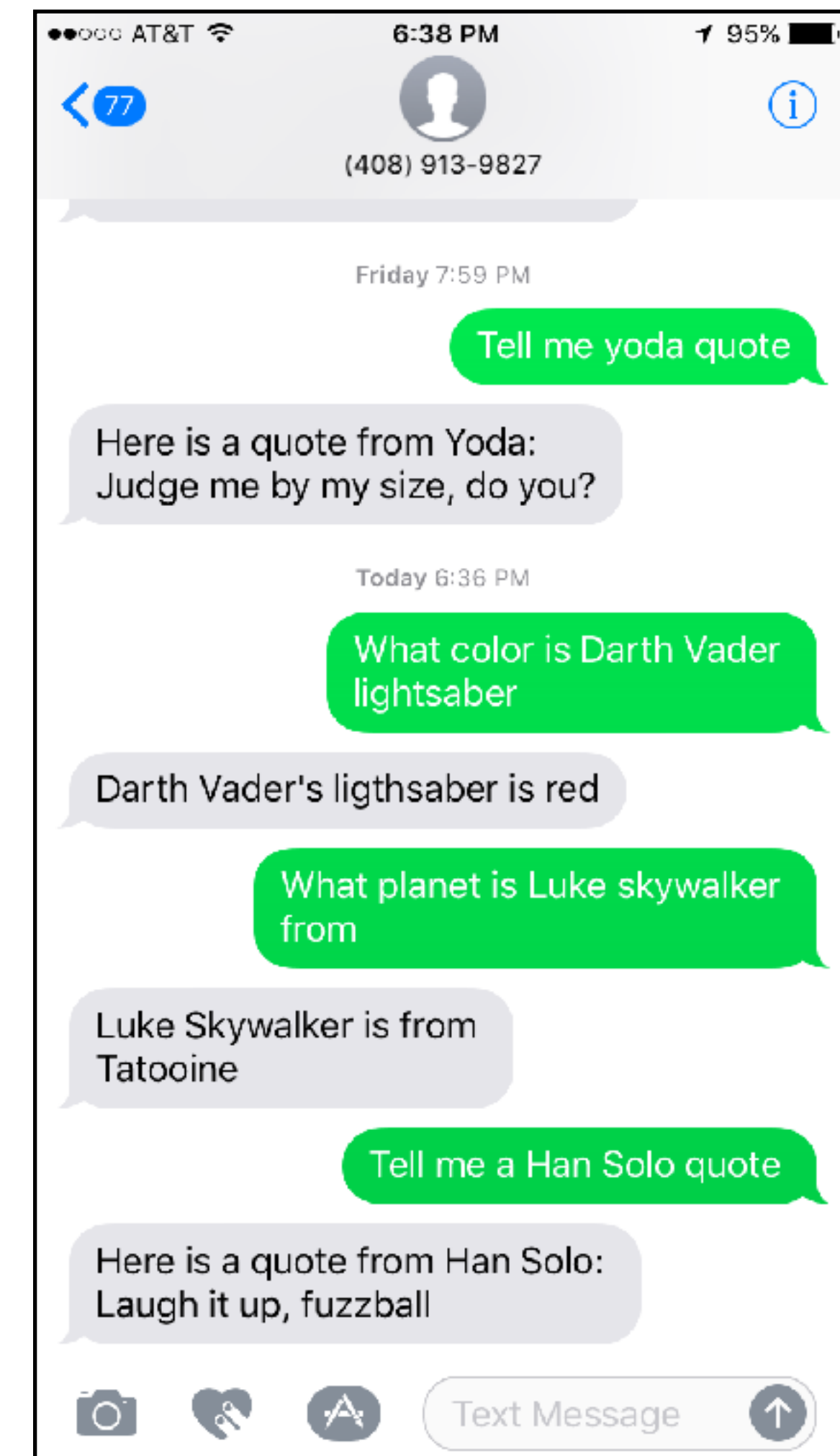
- Service for building conversational interfaces using voice and text
- Provides
 - Automatic Speech Recognition (ASR): speech -> text
 - Natural Language Understanding (NLU): text -> intent
- Powered by the same deep learning technologies as Alexa
- <http://aws.amazon.com/lex>

BYOC #2: Twilio

The screenshot shows the Twilio console interface for a channel named 'StarWars'. The 'Channels' tab is selected, and the 'Twilio SMS' channel is highlighted in the left sidebar. The main form contains the following fields:

- Name***:
- Description**:
- IAM Role**: [AWSServiceRoleForLexChannels](#) (Automatically created on your behalf)
- KMS key**:
- Alias***:
- Account SID***:
- Authentication Token***:

An **Activate** button is located below the form fields. Below the form, the 'Callback URLs' section shows a single entry: 'starwars_sms (starwars)' with a 'Delete' button. At the bottom, the 'Endpoint URL' is displayed as 'https://channels.lex.us-east-1.amazonaws.com/twili...' with a 'Copy' button.



BYOC #2: Slack

< StarWars Latest ▾

Editor Settings Channels Monitoring

Chatbots

Facebook

Slack

Twilio SMS

IAM Role [AWSServiceRoleForLexChatbot](#)
Automatically created on your behalf

KMS key

Alias*

Client Id*

Client Secret*

Verification Token*

Success Page URL


Activate

Callback URLs

StarWarsSlack (starwars)

Postback URL: <https://channels.lex.us-east-1.amazonaws.com/starwars-slack>

OAuth URL: <https://channels.lex.us-east-1.amazonaws.com/starwars-slack>




star_wars_chatbot ●
star_wars_chatbot

This is the very beginning of your direct message history with **star_wars_chatbot**.


[? How does star_wars_chatbot work?](#)

Today




arungupta 9:14 PM

tell me a yoda quote




Star Wars Chatbot APP 9:14 PM

Here is a quote from Yoda: That is why you fail.




arungupta 9:14 PM

what color is Luke skywalker lightsaber




Star Wars Chatbot APP 9:14 PM

Luke Skywalker's lightsaber is blue



arungupta 9:14 PM

which planet is Darth Vader from



Star Wars Chatbot APP 9:14 PM ☆

Darth Vader is from Tatooine

14

BYOC #2: Facebook Messenger

The image shows a screenshot of the StarWars chatbot configuration interface and a preview of the chatbot's interaction.

Configuration Interface:

- StarWars Latest** (dropdown menu)
- Editor** | **Settings** | **Channels** | **Monitoring** (tabs)
- Chatbots** (left sidebar):
 - Facebook (selected)
 - Slack
 - Twilio SMS
- Configuration Fields:**
 - Name***:
 - Description**:
 - IAM Role**: [AWSServiceRole](#) (Automatically created)
 - KMS key**:
 - Alias***:
 - Verify Token***:
 - Page Access Token***:
 - App Secret Key***:
 - Activate** (button)
- Callback URLs**
 - StarWarsChatbot (starwars)
 - Endpoint URL: <https://channel>

Chatbot Preview:

- Star Wars Chatbot** (1 person likes this)
- 5:21PM**:
- 6:27PM**:
- Star Wars Chatbot**: Here is a quote from Yoda: When nine hundred years old you reach, look as good you will not.
-
- Star Wars Chatbot**: Luke Skywalker's lightsaber is blue
-
- Star Wars Chatbot**: Darth Vader is from Tatooine

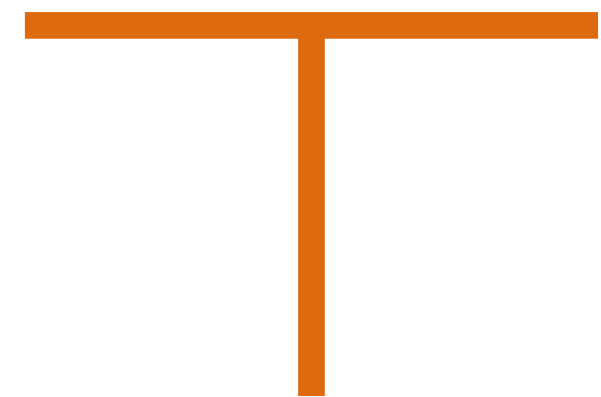
BYOC #2: *AngularJS*

BYOC #2: Mobile

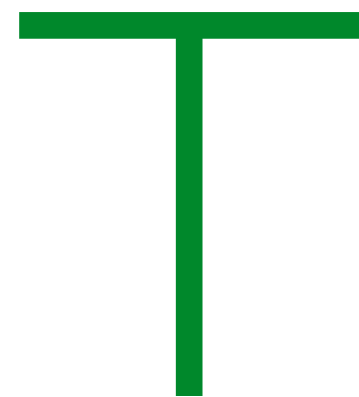
BYOC #3: Build an Alexa Skill

- Front end
 - Voice User Interface (VUI)
 - Intent, slot, slot-types, utterances, resources
 - Export Lex bot configuration
 - Can also be created from scratch (if starting here)
 - developer.amazon.com
- Back end
 - Lambda function with Alexa Skill Kit (ASK) trigger
 - aws.amazon.com
- Skill certification

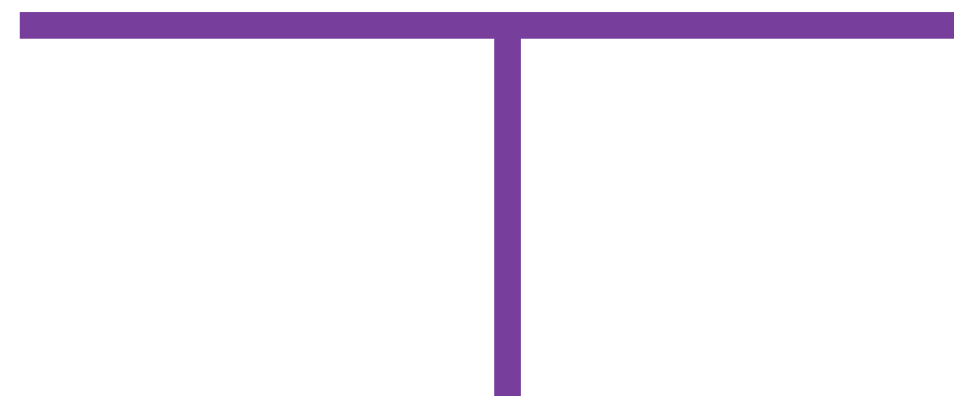
Alexa, ask Star Wars tell me a Yoda quote



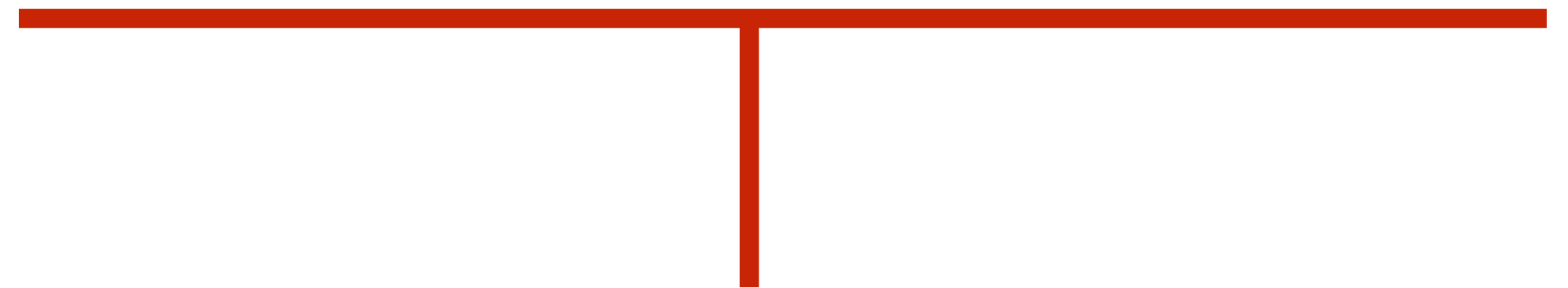
Wake
word



Starting
phrase



Skill
invocation
name



Utterance

Security

- AmazonServiceRoleForLexBots
- IAM permissions??

Logging

- CloudWatch

Monitoring

- CloudTrail
- X-Ray

CI/CD Pipeline

- CodePipeline

References

- Amazon Lex: aws.amazon.com/lex
- Developer Portal: developer.amazon.com
- Slides & code: github.com/arun-gupta/chatbot