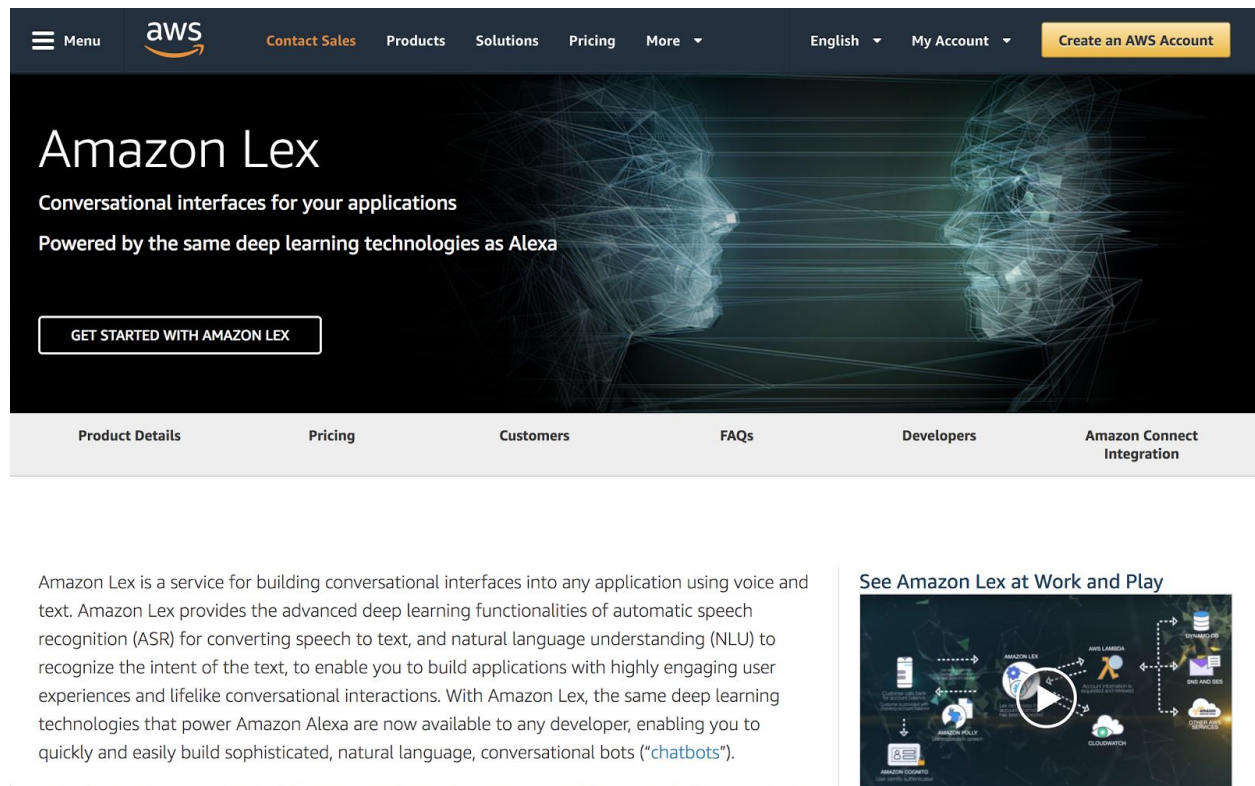


# Building Chatbots using Amazon Lex: A Primer

This blog post will introduce a newbie to building a chatbot using the [Lex](#) methodology/toolkit from Amazon. We will demonstrate the basic building blocks and then move on to creating a live application. Our approach will be a step-by-step method. Here is the main landing page for Lex:



You can find a working model of a sample chatbot at the URL below:

<http://vardangupta.s3-website-us-east-1.amazonaws.com/>

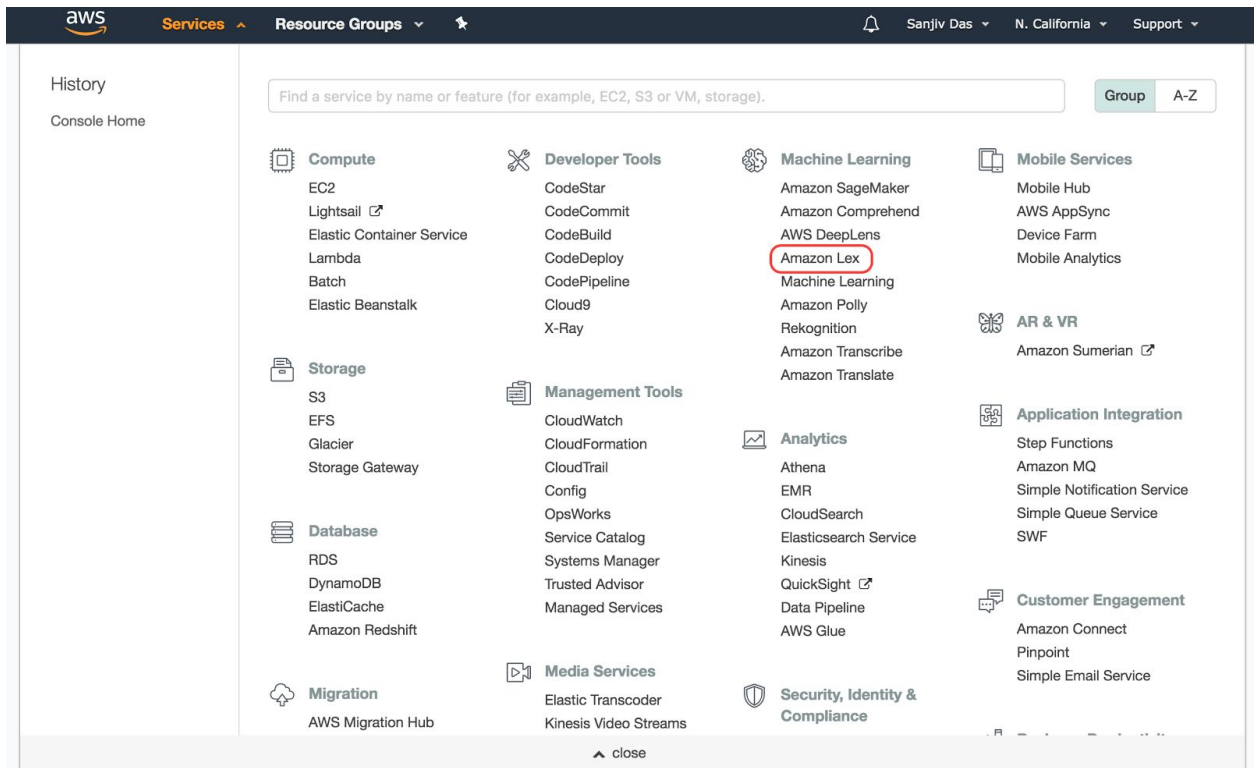
Some reading:

<https://work.qz.com/1147692/harness-the-power-of-bots-to-automate-the-busy-work/>


## Basic Setup

- (1) Sign up for an AWS account and sign in in: <https://aws.amazon.com/console/>
- (2) Go to the dashboard and search for Lex under AWS services. Open the lex services and create the new chatbot. Select the purpose of your chatbot from existing


examples or create your own. To make this demonstration even more explanatory let's move ahead with the custom bot.




When you click on "Amazon Lex" you reach this screen.



Services ▾Resource Groups ▾★

Sanjiv Das ▾N. Virginia ▾Support ▾



## Amazon Lex

Amazon Lex is a service for building conversational interfaces using voice and text. With Lex, the same deep learning engine that powers Alexa is now available to any developer, enabling you to bring sophisticated, natural language chatbots to your new and existing applications.

Get Started

[Getting Started Guide](#)



### High Quality Deep Learning Technologies

Powered by the same technology as Alexa, Lex provides both automatic speech recognition (ASR) and natural language understanding (NLU) technologies to create a



### Seamlessly Deploy and Scale

You can build, test, and deploy your chatbots directly from the AWS Management Console. Lex allows you to easily publish your voice or text chatbots, so you can access them from mobile apps, web apps, and multiple chat



### Built-in Integration with the AWS Platform

Amazon Lex has native interoperability with several AWS services such as Amazon Cognito, AWS Lambda, Amazon DynamoDB, Amazon CloudWatch, and AWS Mobile Hub,

The main components of the bot are shown below: Intents, Utterances, Slots, Prompts, and Fulfillment.

## Create your Lex bot

Amazon Lex enables any developer to build conversational chatbots quickly and easily. With Amazon Lex, no deep learning expertise is necessary—you just specify the basic conversational flow directly from the console, and then Amazon Lex manages the dialogue and dynamically adjusts the response. To get started, you can choose one of the sample bots provided below or build a new custom bot from scratch.

CREATE YOUR OWN

TRY A SAMPLE

Custom bot

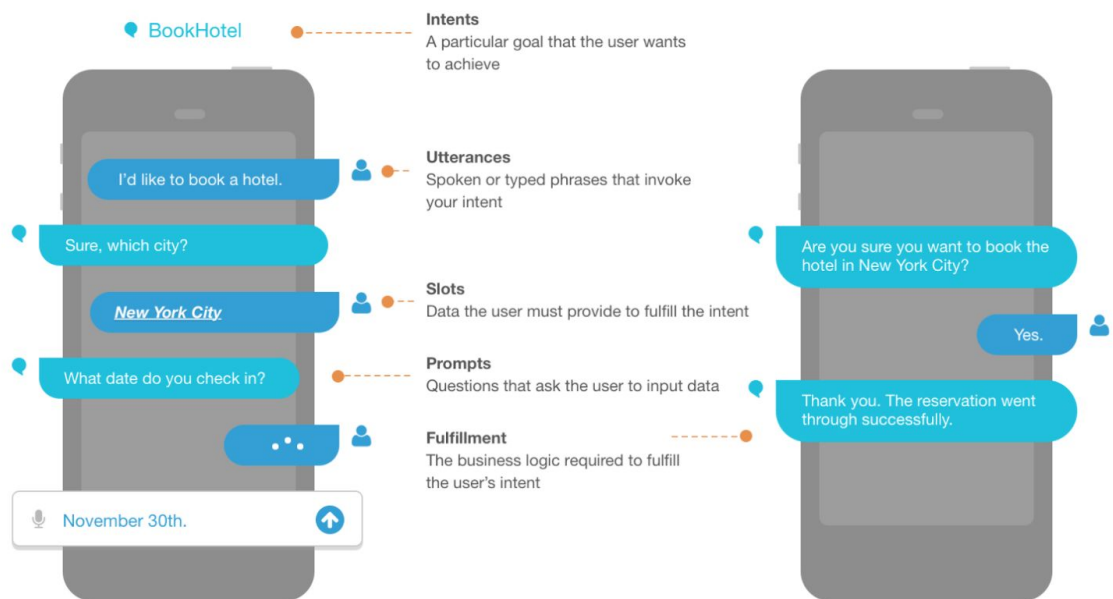
BookTrip

OrderFlowers

ScheduleAppointment

Bot name

BookTrip



## Building a Custom Bot

We will pick a custom bot and fill out the basic information in the form depending on the type of use.

## Create your Lex bot

Amazon Lex enables any developer to build conversational chatbots quickly and easily. With Amazon Lex, no deep learning expertise is necessary—you just specify the basic conversational flow directly from the console, and then Amazon Lex manages the dialogue and dynamically adjusts the response. To get started, you can choose one of the sample bots provided below or build a new custom bot from scratch.

CREATE YOUR OWN

TRY A SAMPLE

Custom bot

BookTrip

OrderFlowers

ScheduleAppointment

Bot name

LaptopEnquiry

Language

English (US)

Output voice

None. This is only a text based application.

Session timeout

5

min

IAM role

AWSServiceRoleForLexBots

Automatically created on your behalf

COPPA

Please indicate if your use of this bot is subject to the [Children's Online Privacy Protection Act \(COPPA\)](#). [Learn more](#)

☐ Yes ☒ No

Cancel

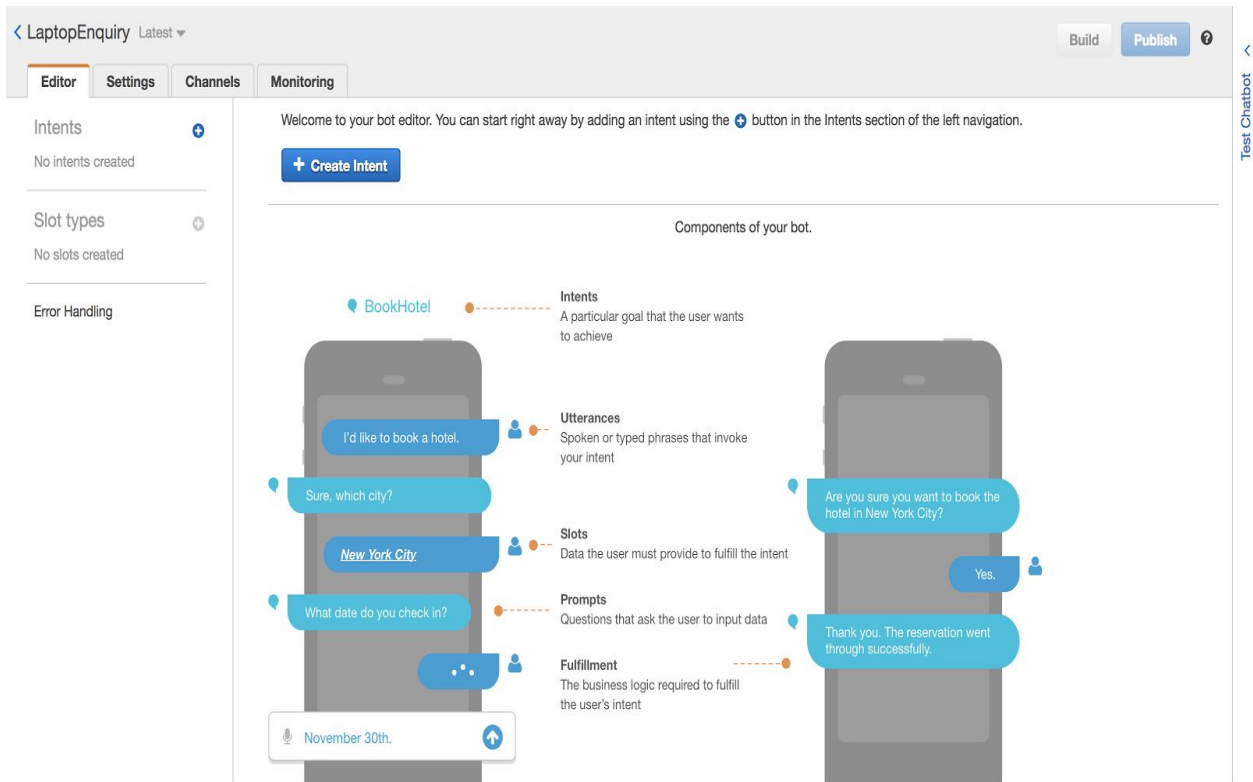
Create

You will land on your chatbot console where you can edit and customize your chatbot. Before moving forward, let's understand some basic terminologies that we will be using throughout the tutorial.

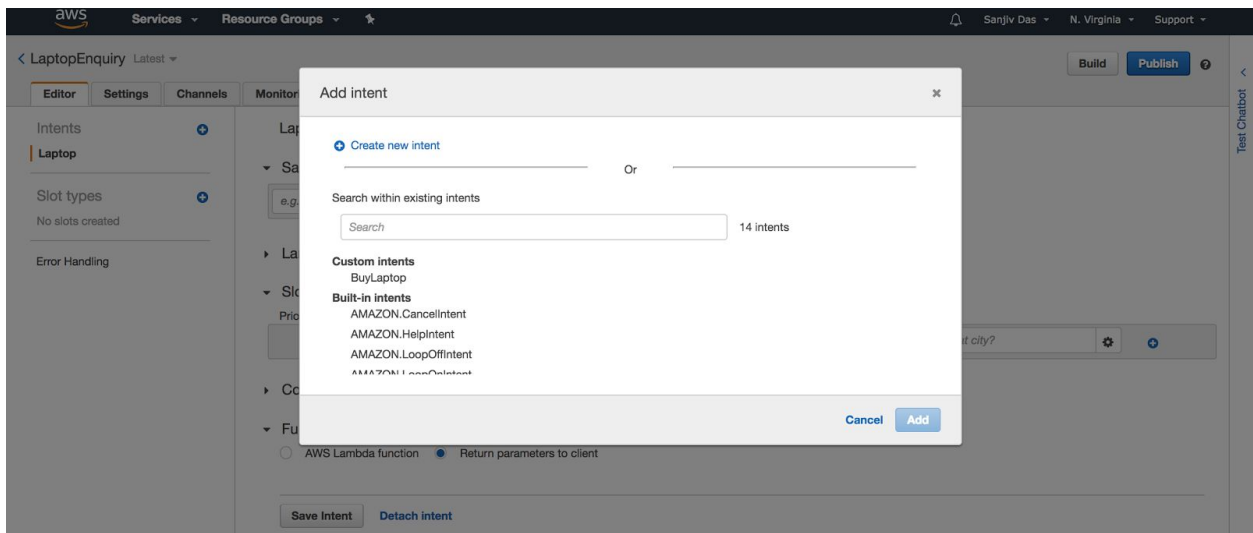
- **Intent:** Represents an action that the user wants to perform.
- **Utterances:** Sentences by a user to represent an intent. Example: I want to enquire about a laptop.
- **Slot:** Sets of information supplied by the user and required by the intent for it to get completed. The information may or may not be mandatory and is asked from the user while chatting with the user i.e., during the runtime.
- **Slot Types:** Each slot belongs to a particular type and has different properties related to the type of input from the user. Lex has hundreds of inbuilt slot types but users can always define their own.

We take the example of a "Laptop Enquiry" for this tutorial.

This is the dashboard of the chatbot where all the functionality can be modified. Firstly we have to define a new **intent** and its operation.



This is the screen which comes up when we create a new intent or we are currently on any of the intent. Here, inside the sample utterances we define various sentences or responses from the user, that will tell the chatbot about the intent of user.



Next, we define multiple utterances so that the user may ask for any information in many different ways from the system.

aws Services Resource Groups

LaptopEnquiry Latest

Build Publish

Editor Settings Channels Monitoring

Intents

Laptop

Slot types

No slots created

Error Handling

Laptop Latest

Sample utterances

I am looking for a laptop

I am looking for laptops

I want to buy a laptop

purchase a laptop

laptop computer

laptop

computer

Lambda initialization and validation

Slots

Priority	Required	Name	Slot type	Prompt
		e.g. Location	e.g. AMAZON.U...	e.g. What city?

Confirmation prompt

Fulfillment

☐ AWS Lambda function ☒ Return parameters to client

We add in new slots.

aws Services Resource Groups

LaptopEnquiry Latest

Build Publish

Editor Settings Channels Monitoring

Intents

Laptop

Slot types

NewOrOld

Spend

Error Handling

Laptop Latest

Sample utterance

e.g. I would like to buy a laptop

I am looking for a laptop

I am looking for laptops

I want to buy a laptop

purchase a laptop

laptop computer

laptop

computer

Lambda initialization and validation

Slots

Priority	Required	Name	Slot type	Prompt
		e.g. Location	e.g. AMAZON.U...	e.g. What city?
1.	✓	NewOrOld	NewOrOld	Do you want a new or old laptop?
2.	✓	Spend	Spend	Up to how much are you willing to spend?

Confirmation prompt

☐ Confirmation prompt

Edit slot type

NewOrOld Latest

Purchasing a new or old laptop

Slot Resolution

☒ Expand Values ☐ Restrict to Slot values and Synonyms

Value

e.g. Small

New

Cancel Save slot type Add slot to intent

**Laptop** Latest

Intents

**Laptop**

Slot types

NewOrOld

Spend

Error Handling

**Sample utterances**

- e.g. I would like to book a flight.
- I am looking for a laptop
- I am looking for laptops
- I want to buy a laptop
- purchase a laptop
- laptop computer
- laptop
- computer

**Lambda initialization and validation**

**Slots**

Priority	Required	Name	Slot type	Prompt
1.	<input checked="" type="checkbox"/>	NewOrOld	NewOrOld	Do you want a new or old laptop?
2.	<input checked="" type="checkbox"/>	Spend	Spend	Up to how much are you willing to

Slots appear here

Now, add in all possible ways in which you may want the bot to respond.

**Spend Prompts**

**Prompts**

- e.g. What is your destination?
- What is your budget?
- Up to how much are you willing to spend?

**Maximum number of retries**

2

**Corresponding utterances**

- e.g. I would like to go to {toCity}
- What is your {Spend}

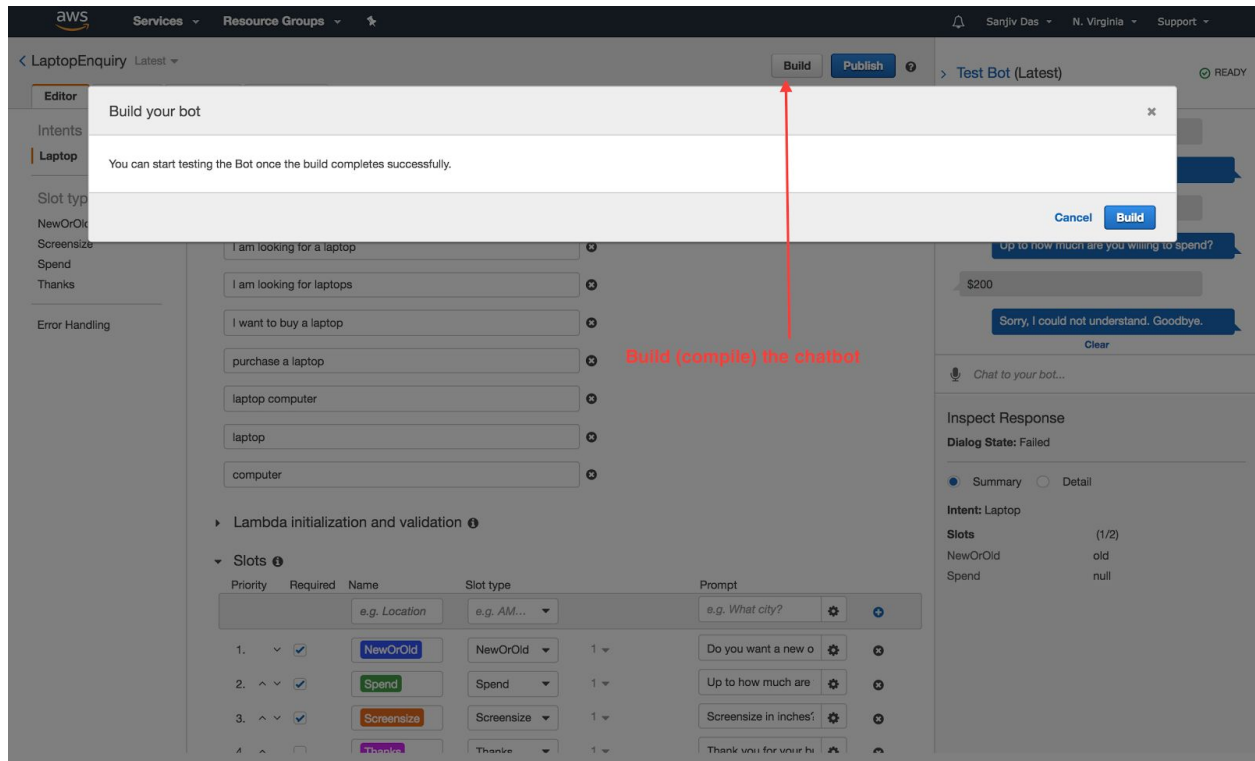
**Prompt response cards**

Card image	Card title	Card subtitle	Preview
e.g. url	e.g. Card title text	e.g. Card subtitle text	Facebook
Button value	Button title		
None	e.g. Button title		
None	e.g. Button title		
None	e.g. Button title		

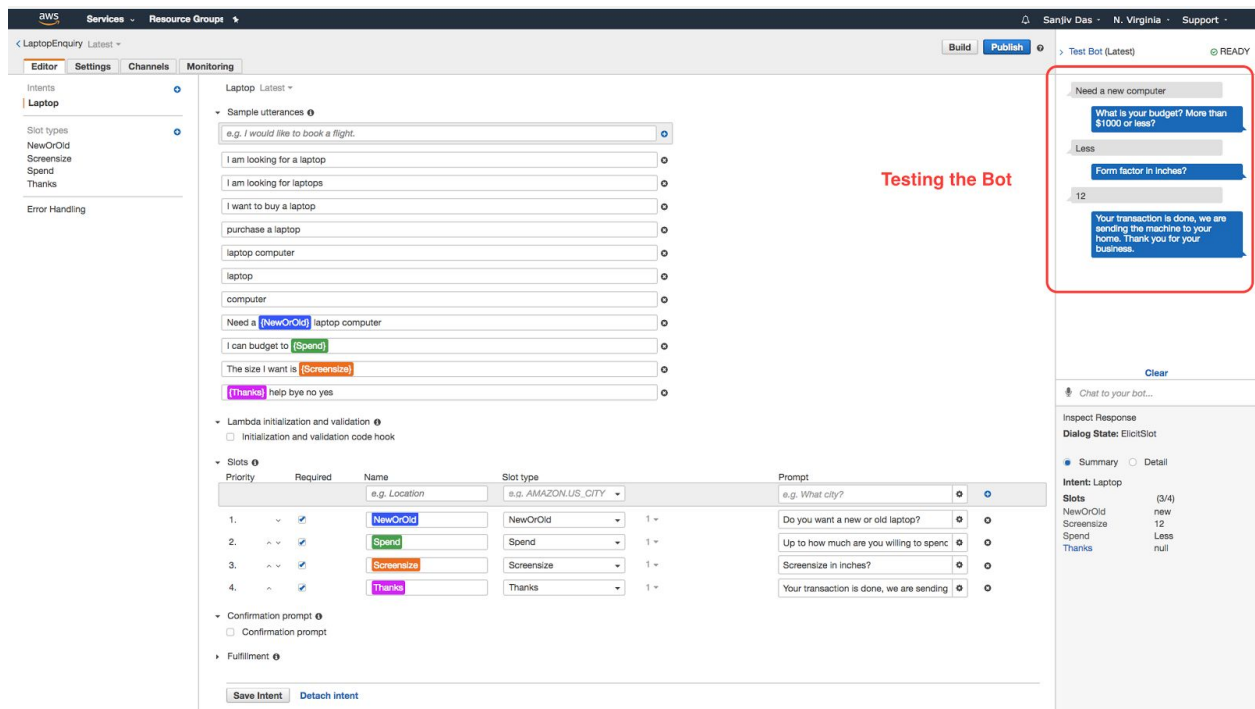
Different ways in which the bot may respond

Then, build the chatbot.

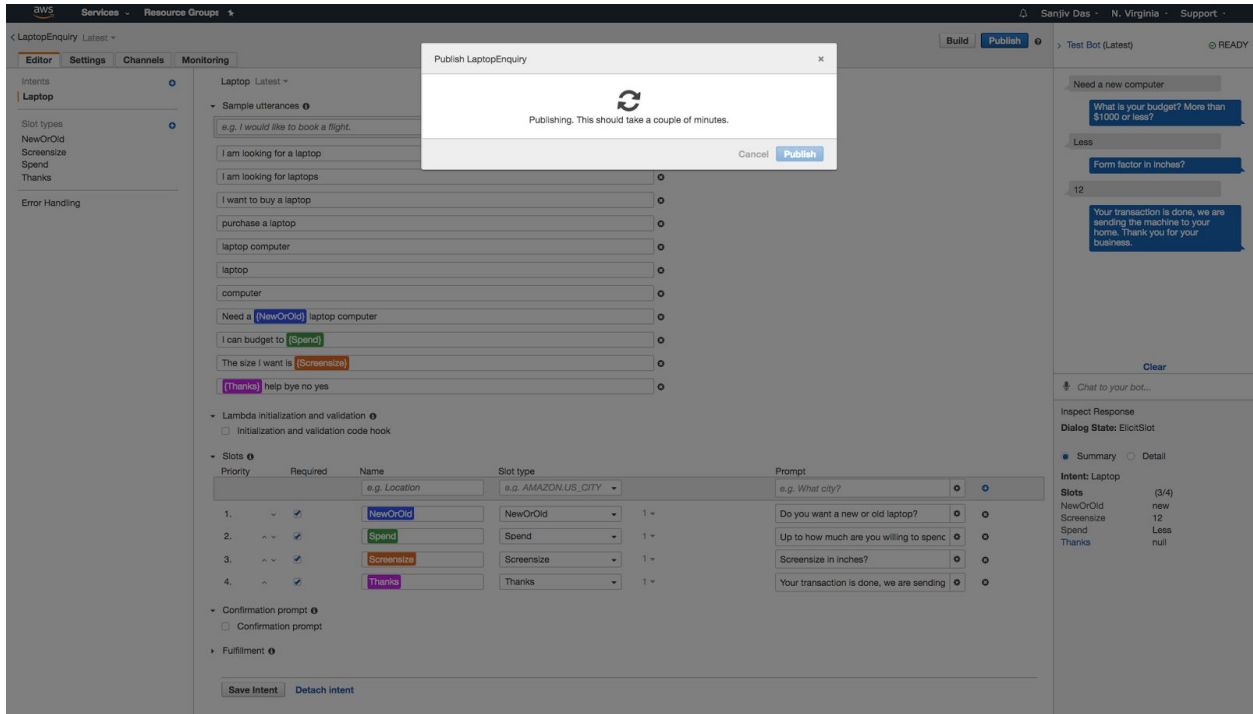




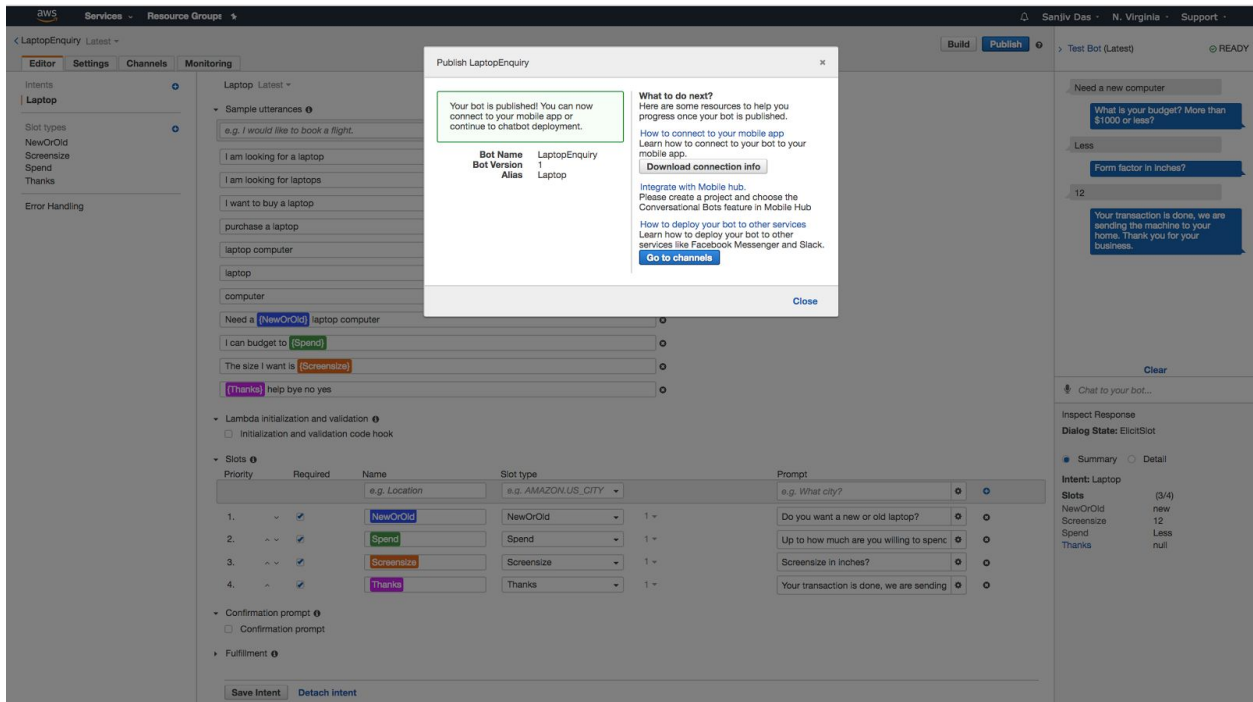
Finally, we test the bot.



We may then publish the bot.



Here is what you get after publishing the bot.



You can set up a callback URL in the channels tab.

Services

Resource Groups

Sanjiv Das

N. Virginia

Support

LaptopEnquiry

Latest

Build

Publish

Test Bot (Latest)

READY

Channels

Facebook

Kik

Slack

Twilio SMS

Facebook

Fill in the form below and click activate to get a callback URL to use with Facebook. You can generate multiple callback URLs. [Learn more](#) on steps to integrate with Facebook.

Channel Name\*

Channel Description

IAM Role

AWSServiceRoleForLexChannels

Automatically created on your behalf

KMS Key

aws/lex

Alias\*

Verify Token\*

Page Access Token\*

App Secret Key\*

\* Required Field

Callback URLs

Fill in the form above and click activate to get a callback URL. You can generate multiple callback URLs.

Activate

Type an utterance below to begin a conversation with your chatbot

Clear

Chat to your bot...

Inspect Response

Done!

Edited out material

LaptopEnquiry Latest ▾

Build Publish ?

Editor Settings Channels Monitoring

Intents +

BuyLaptop

Slot types +

Binary

LaptopUses

Screensize

Error Handling

BuyLaptop Latest ▾

Sample utterances ⓘ

e.g. I would like to book a flight. +

I would like to buy a laptop ×

{OldPackageOrNew} ×

{LaptopUses} ×

I want a {ScreenSize} ×

I have a budget of {InvestmentAmount} ×

Lambda initialization and validation ⓘ

Slots ⓘ

Priority	Required	Name	Slot type	Prompt
		e.g. Location	e.g. A...	e.g. What city? ⚙️ +
1.	✓	OldPackageOrNew	Binary	Is there any packi ⚙️ ×
2.	✓	LaptopUses	Lapto...	What will be the 3 ⚙️ ×

Test Bot (Latest) READY

I would like to buy a laptop

Is there any package you are interested in or you want help to select one?

new

What will be the 3 main uses of this

Clear

Chat to your bot...

Inspect Response

Dialog State: ReadyForFulfillment

Summary Detail

Intent: BuyLaptop

Slots (4/4)

InvestmentAmount 1000

LaptopUses programming

OldPackageOrNew new

ScreenSize 13 inch

## BuyLaptop Latest ▾

### Sample utterances ⓘ

e.g. I would like to book a flight. +

I would like to buy a laptop ×

{OldPackageOrNew} ×

{LaptopUses} ×

I want a {ScreenSize} ×

I have a budget of {InvestmentAmount} ×

▼ Slots ⓘ

Priority	Required	Name	Slot type		Prompt		
		<input type="text" value="e.g. Location"/>	<input type="text" value="e.g. A..."/>		<input type="text" value="e.g. What city?"/>	⚙️	+
1.	✓	<input type="text" value="OldPackageC"/>	<input type="text" value="Binary"/>	1	<input type="text" value="Is there any packe"/>	⚙️	✕
2.	✓	<input type="text" value="LaptopUses"/>	<input type="text" value="Lapto..."/>	1	<input type="text" value="What will be the 3"/>	⚙️	✕
3.	✓	<input type="text" value="ScreenSize"/>	<input type="text" value="Scree..."/>	1	<input type="text" value="What is the prefer"/>	⚙️	✕
4.	✓	<input type="text" value="InvestmentAr"/>	<input type="text" value="AMAZ..."/>	Built-in	<input type="text" value="How much are yo"/>	⚙️	✕

I would like to buy a laptop

Is there any package you are interested in or you want help to select one?

new

What will be the 3 main uses of this laptop?

programming

What is the preferred screen size?

13 inch

How much are you planning to invest?

1000\$

Intent BuyLaptop is ReadyForFulfillment:  
InvestmentAmout:1000  
LaptopUses:programming  
OldPackageOrNew:new ScreenSize:13  
inch