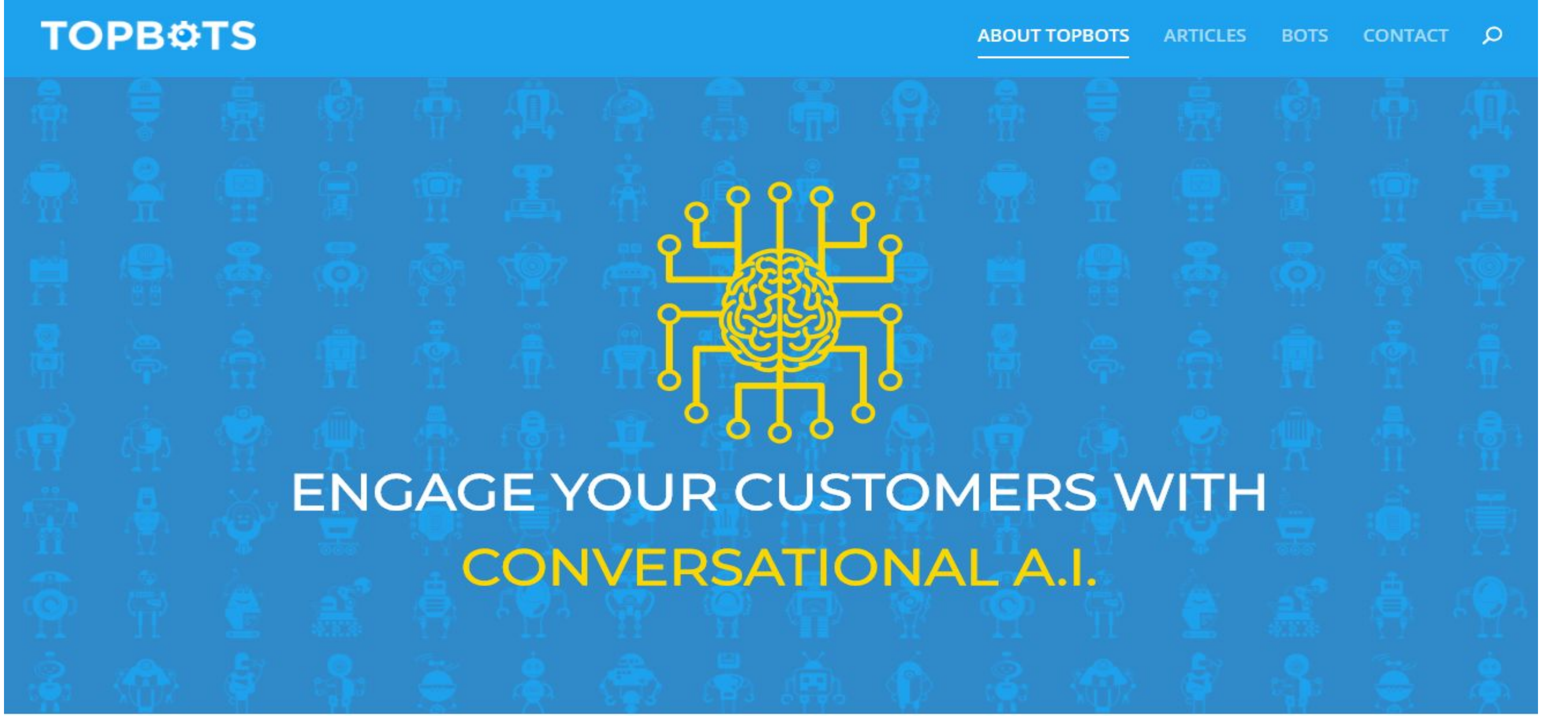
Chatbots

Sanjiv R. Das

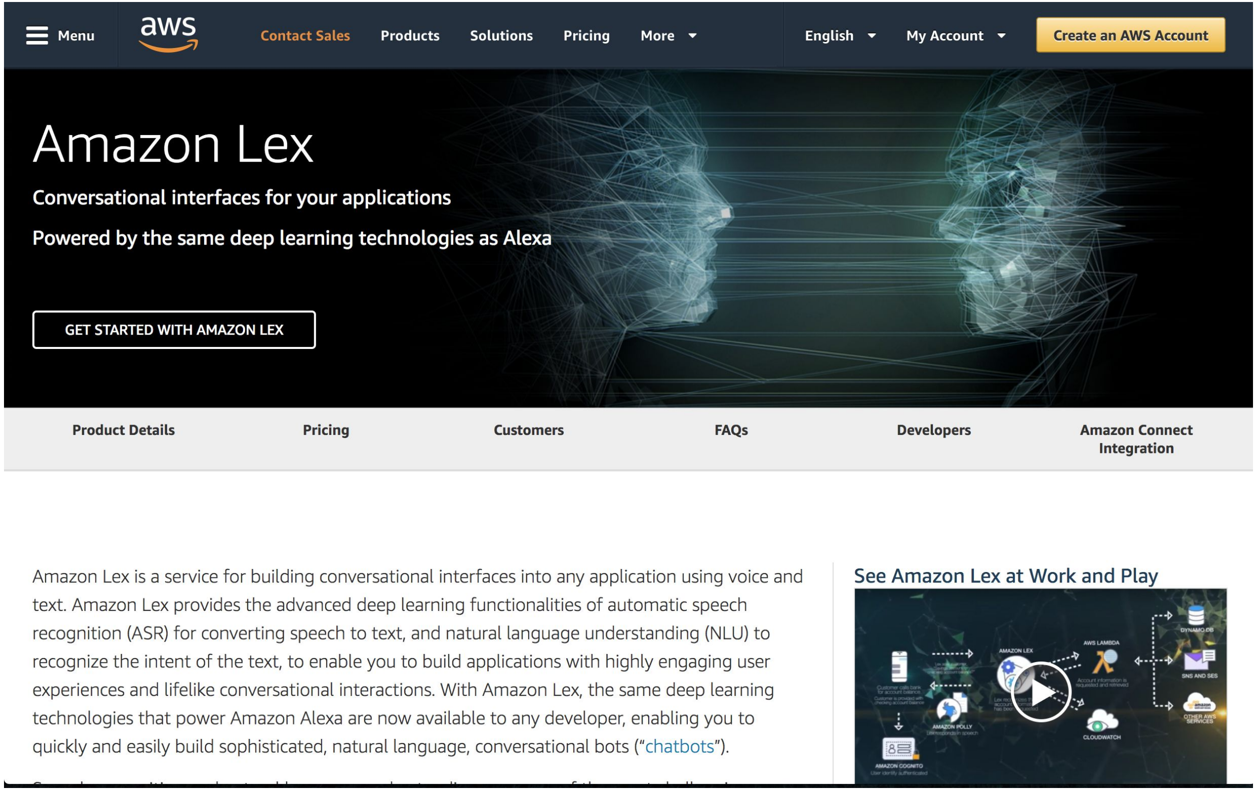


ENGAGE YOUR CUSTOMERS WITH CONVERSATIONAL A.I.

WE RAISE YOUR A.I. IQ

http://www.topbots.com

Amazon Lex



Amazon Lex

Conversational interfaces for your applications

Powered by the same deep learning technologies as Alexa

Amazon Lex is a service for building conversational interfaces into any application using voice and text. Amazon Lex provides the advanced deep learning functionalities of automatic speech recognition (ASR) for converting speech to text, and natural language understanding (NLU) to recognize the intent of the text, to enable you to build applications with highly engaging user experiences and lifelike conversational interactions. With Amazon Lex, the same deep learning technologies that power Amazon Alexa are now available to any developer, enabling you to quickly and easily build sophisticated, natural language, conversational bots ("chatbots").

See Amazon Lex at Work and Play

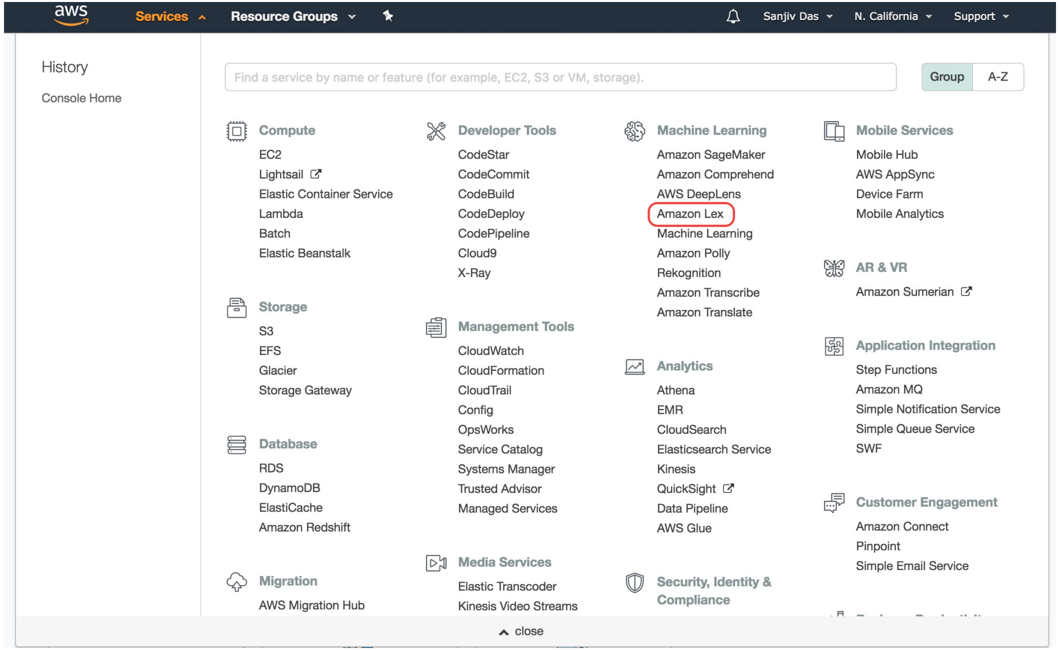
Some readings:

- https://work.qz.com/1147692/harness-the-power-of-bots-to-automate-the-busy-work/
- https://www.datasciencecentral.com/profiles/blogs/beginners-guide-to-chatbots
- https://www.datasciencecentral.com/profiles/blogs/under-the-hood-with-chatbots

https://docs.aws.amazon.com/lex/latest/dg/what-is.html

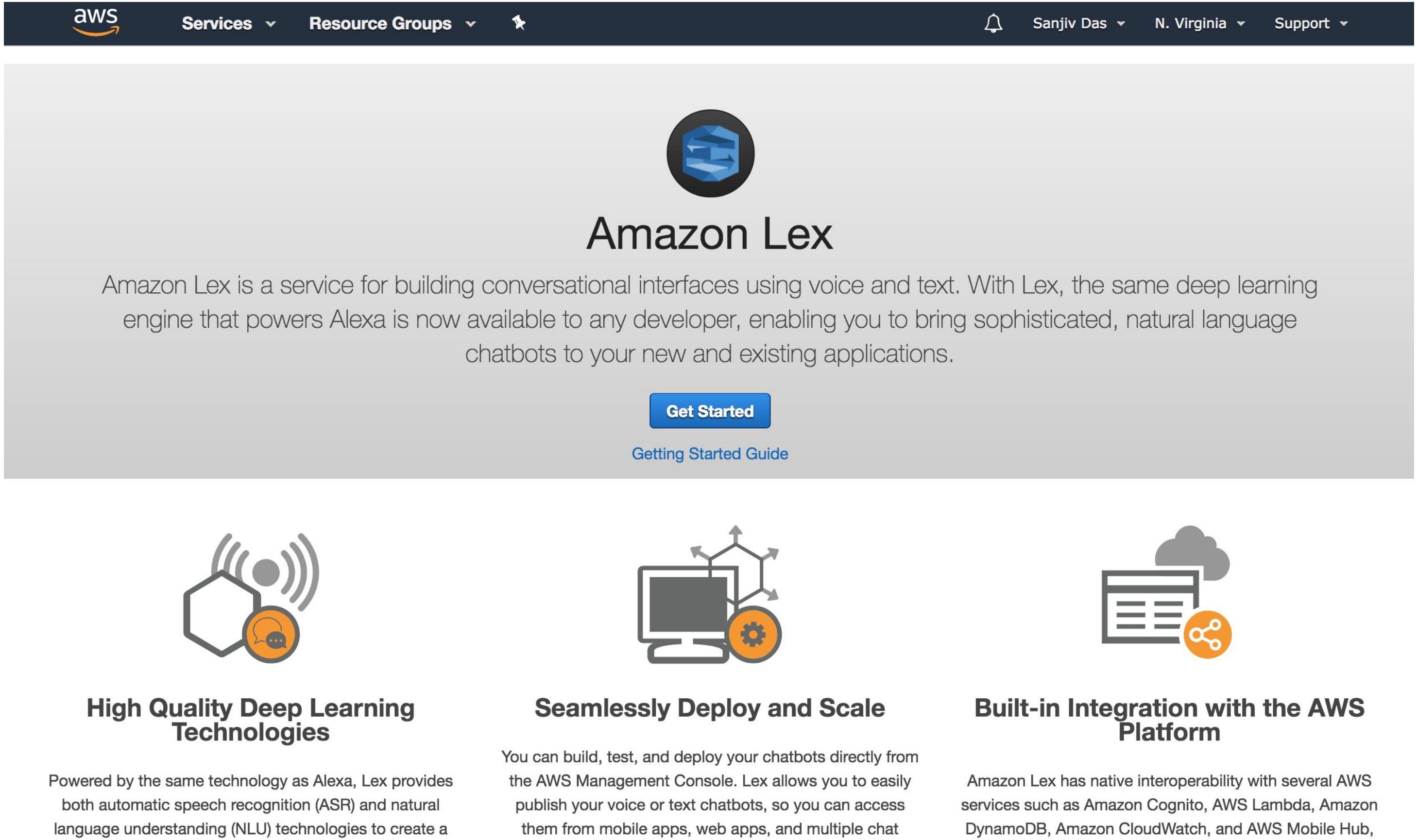
Basic Setup

1. Sign up for an AWS account and sign 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.



Setup

When you click on “Amazon Lex” you reach this screen.



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.

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

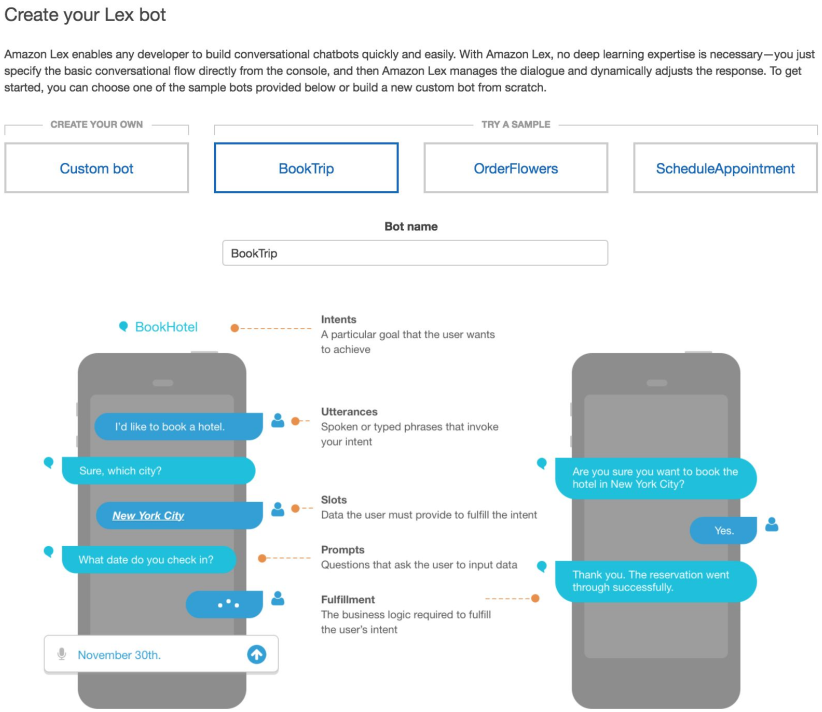
You can build, test, and deploy your chatbots directly from the AWS Management Console. Lex allows you to easily publish your voice or text chatbots, so you can access them from mobile apps, web apps, and multiple chat

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,

Components

The main components of the bot are shown below: Intents, Utterances, Slots, Prompts, and Fulfillment. Let's build a custom bot.



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.

Bot name: BookTrip

BookHotel
I'd like to book a hotel.
Sure, which city?
New York City
What date do you check in?
November 30th.
Are you sure you want to book the hotel in New York City?
Yes.
Thank you. The reservation went through successfully.

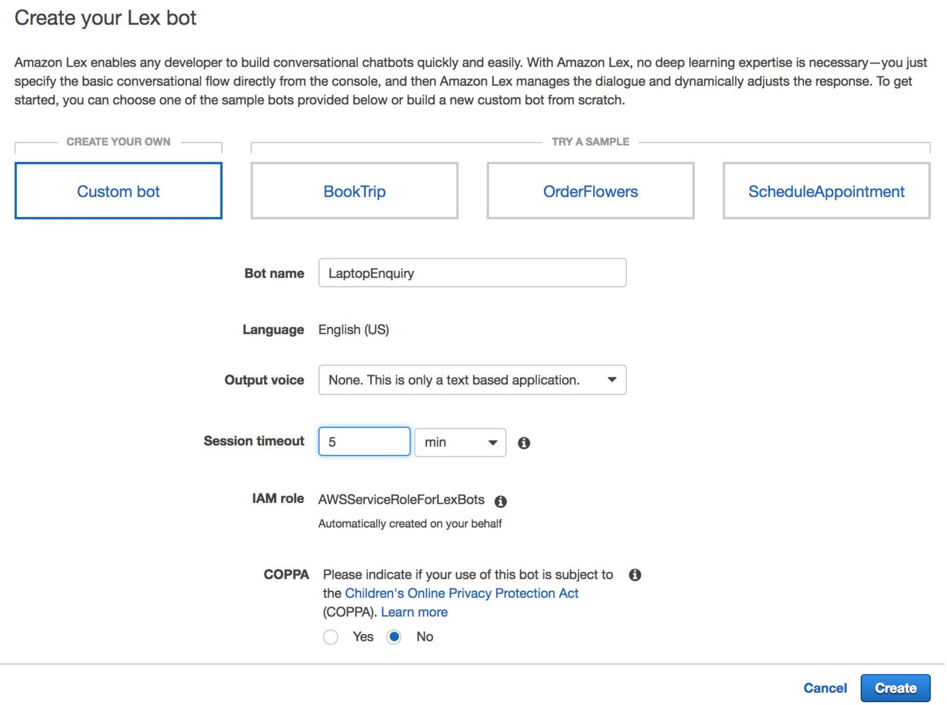
Intents
A particular goal that the user wants to achieve

Utterances
Spoken or typed phrases that invoke your intent

Slots
Data the user must provide to fulfill the intent

Prompts
Questions that ask the user to input data

Fulfillment
The business logic required to fulfill the user's intent



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.

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

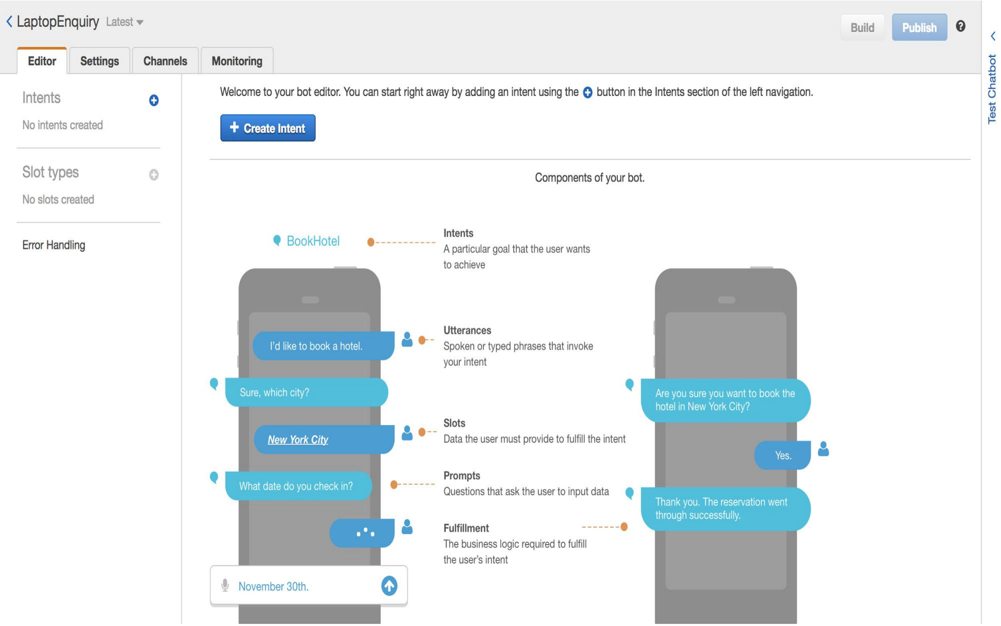
Components

Lets 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.

Example: Laptop Inquiry (Intent)

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.



Welcome to your bot editor. You can start right away by adding an intent using the button in the Intents section of the left navigation.

Components of your bot.

Intents
A particular goal that the user wants to achieve

Utterances
Spoken or typed phrases that invoke your intent

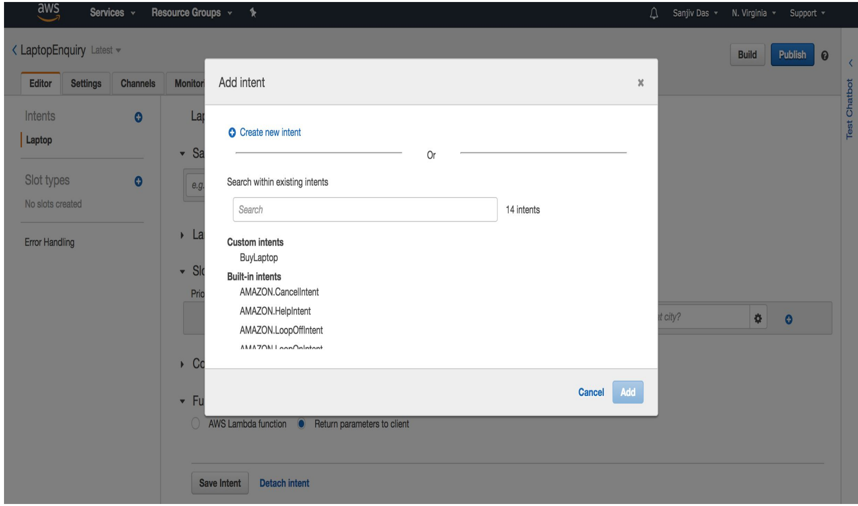
Slots
Data the user must provide to fulfill the intent

Prompts
Questions that ask the user to input data

Fulfillment
The business logic required to fulfill the user's intent

BookHotel
I'd like to book a hotel.
Sure, which city?
New York City
What date do you check in?
November 30th.
Are you sure you want to book the hotel in New York City?
Yes.
Thank you. The reservation went through successfully.

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.



Add intent

Create new intent

Or

Search within existing intents

Search | 14 intents

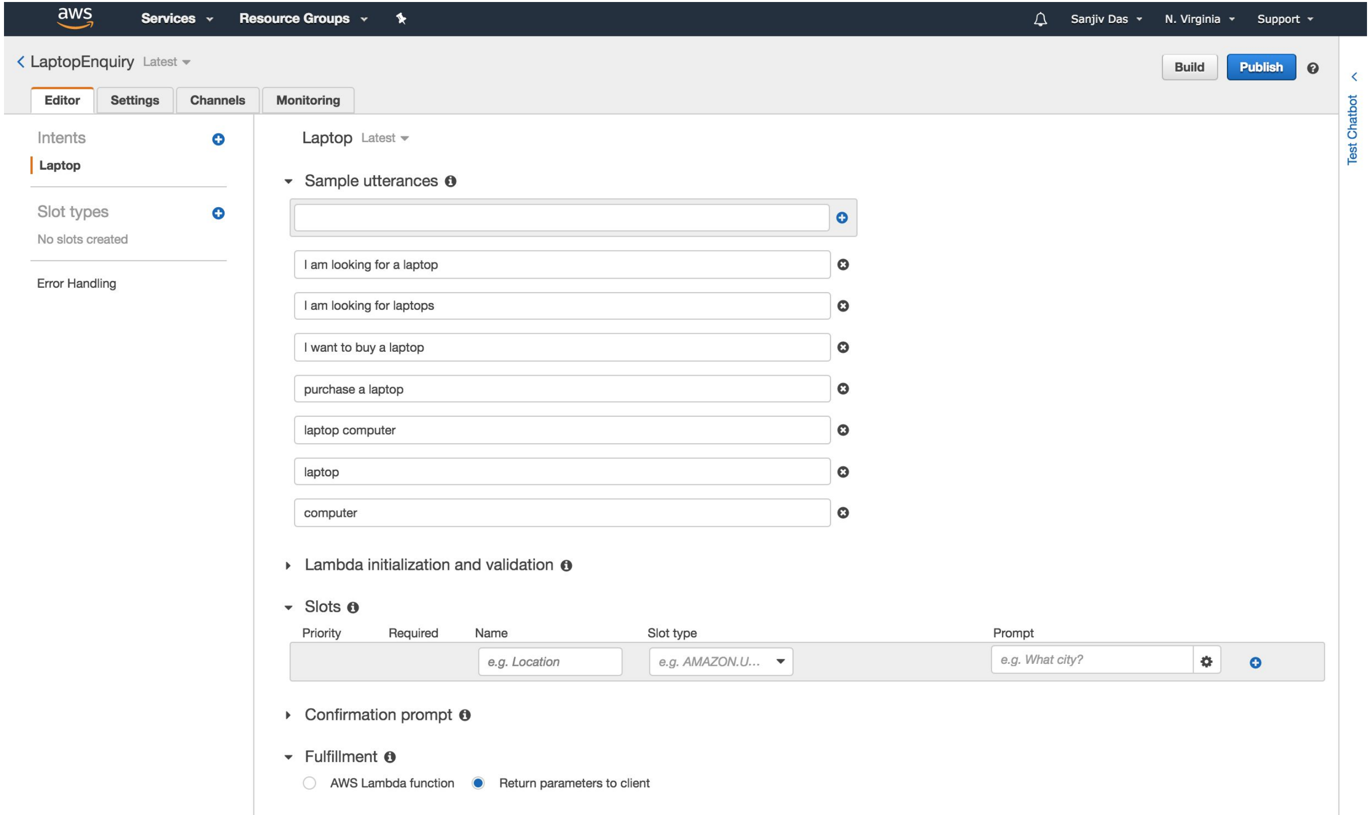
Custom intents
BuyLaptop

Built-in intents
AMAZON.CancelIntent
AMAZON.HelpIntent
AMAZON.LoopOffIntent
AMAZON.LoopOnIntent

Cancel | Add

Utterances

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



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

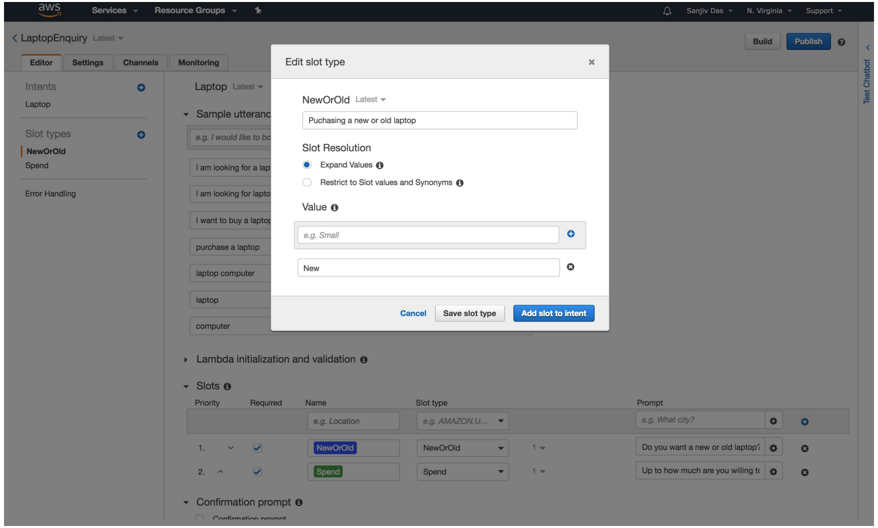
Priority	Required	Name	Slot type	Prompt
		e.g. Location	e.g. AMAZON.U...	e.g. What city?

Confirmation prompt

Fulfillment

○ AWS Lambda function ● Return parameters to client

Slots



Edit slot type

NewOrOld Latest

Puchasing 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

Sample utterances: I am looking for a lap…; I am looking for lapto…; I want to buy a laptop; purchase a laptop; laptop computer; laptop; computer

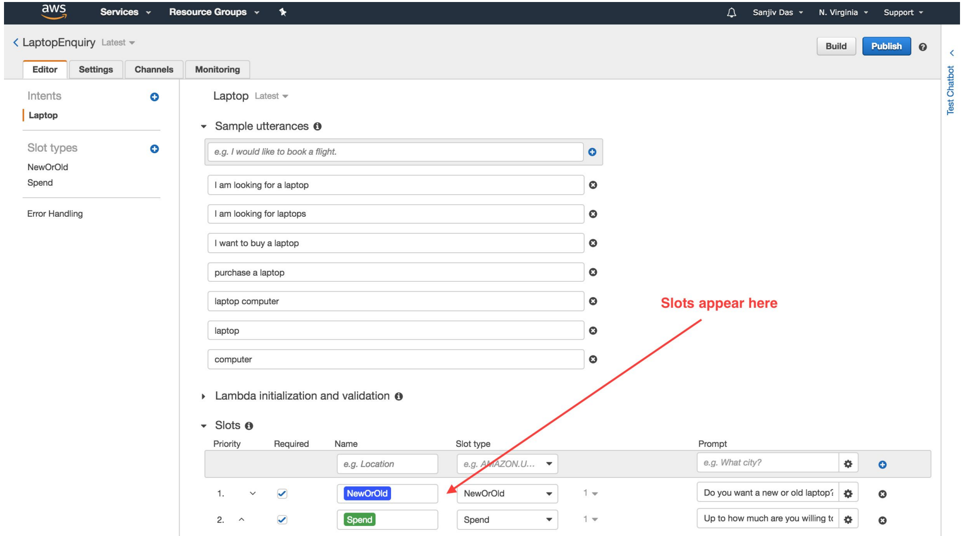
Lambda initialization and validation

Slots

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

Confirmation prompt

Confirmation prompt



Laptop Latest

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

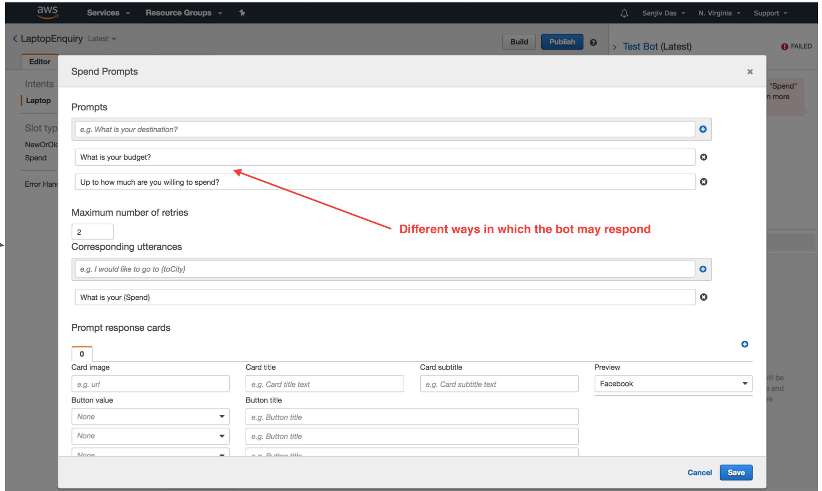
Lambda initialization and validation

Slots

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

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

0

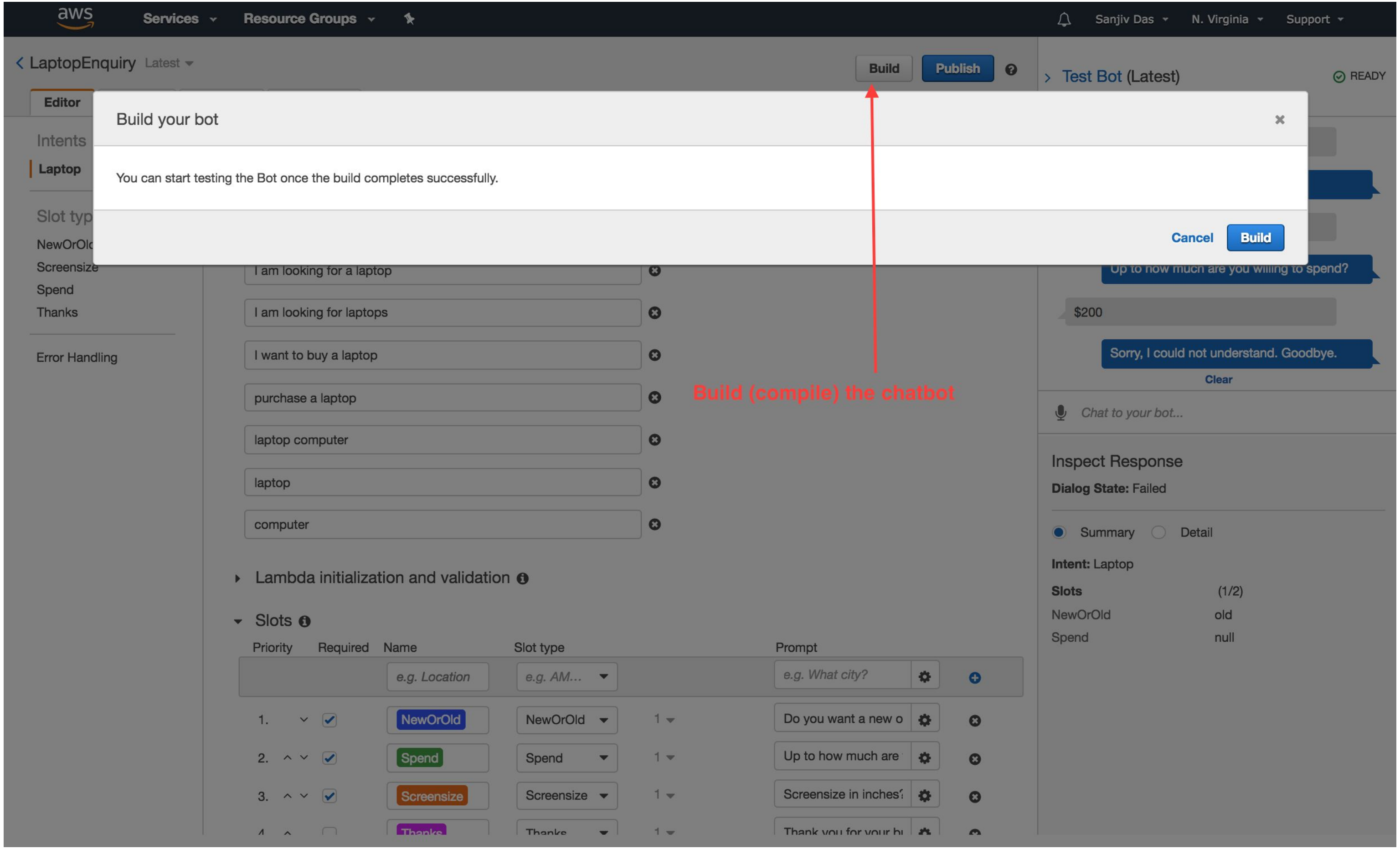
Card image	Card title	Card subtitle	Preview
e.g. url	e.g. Card title text	e.g. Card subtitle text	Facebook

Button value	Button title
None	e.g. Button title
None	e.g. Button title
None	e.g. Button title

Cancel | Save

Different ways in which the bot may respond

Build



Build your bot

You can start testing the Bot once the build completes successfully.

Cancel Build

Build (compile) the chatbot

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. AM...		e.g. What city?
1.	☑	NewOrOld	NewOrOld	1	Do you want a new o
2.	☑	Spend	Spend	1	Up to how much are
3.	☑	Screensize	Screensize	1	Screensize in inches?
4.	□	Thanks	Thanks	1	Thank you for your bu

Up to how much are you willing to spend?

$200

Sorry, I could not understand. Goodbye.

Inspect Response

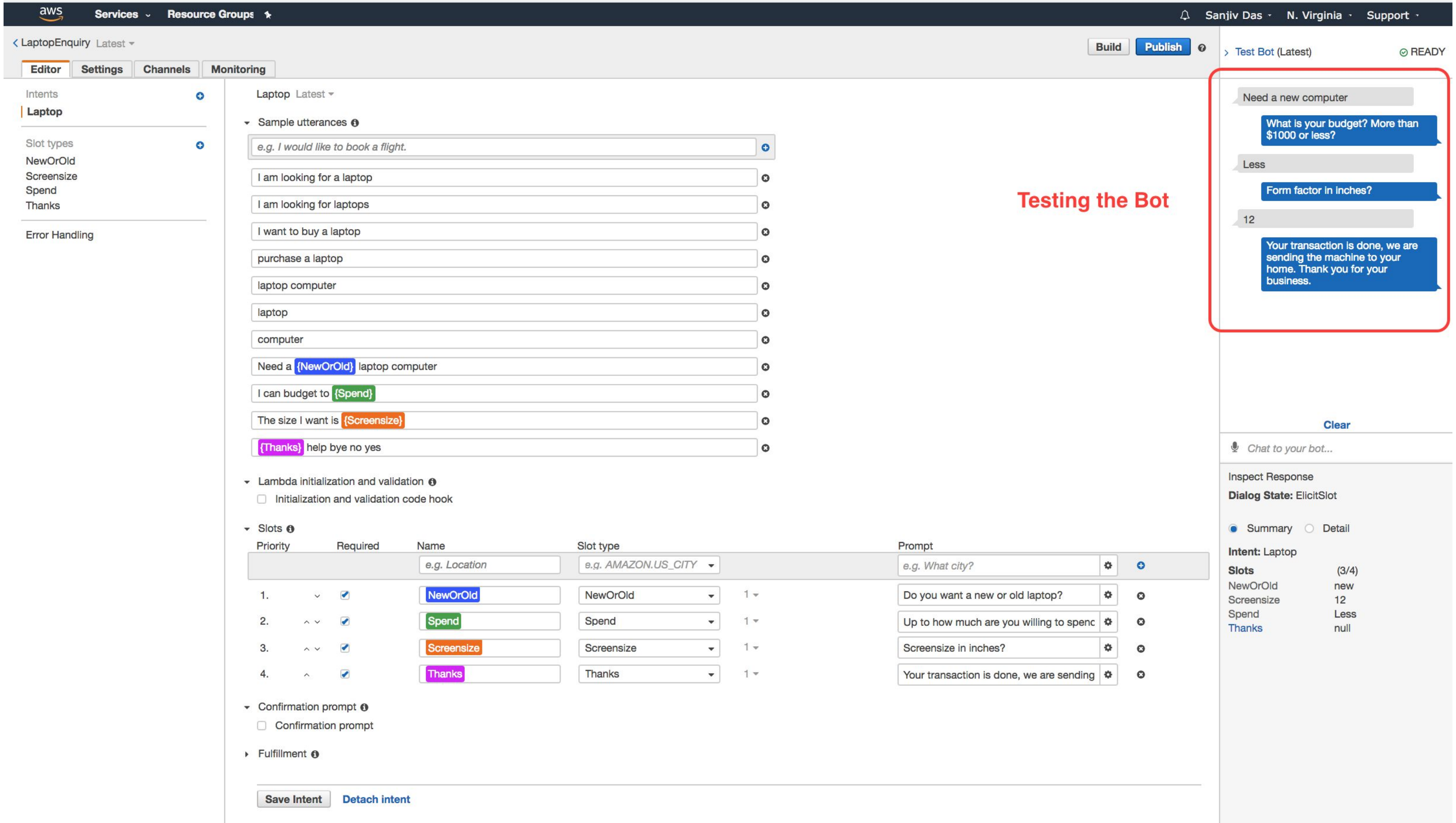
Dialog State: Failed

● Summary ○ Detail

Intent: Laptop

Slots	(1/2)
NewOrOld	old
Spend	null

Test



Intents

Laptop

Slot types

NewOrOld

Screensize

Spend

Thanks

Error Handling

Laptop Latest

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
- Need a {NewOrOld} laptop computer
- I can budget to {Spend}
- The size I want is {Screensize}
- {Thanks} help bye no yes

Lambda initialization and validation

□ Initialization and validation code hook

Slots

Priority	Required	Name	Slot type		Prompt
		e.g. Location	e.g. AMAZON.US_CITY		e.g. What city?
1.	☑	NewOrOld	NewOrOld	1	Do you want a new or old laptop?
2.	☑	Spend	Spend	1	Up to how much are you willing to spenc
3.	☑	Screensize	Screensize	1	Screensize in inches?
4.	☑	Thanks	Thanks	1	Your transaction is done, we are sending

Confirmation prompt

□ Confirmation prompt

Fulfillment

Save Intent   Detach intent

Testing the Bot

Need a new computer

What is your budget? More than $1000 or less?

Less

Form factor in inches?

12

Your transaction is done, we are sending the machine to your home. Thank you for your business.

Clear

Chat to your bot...

Inspect Response

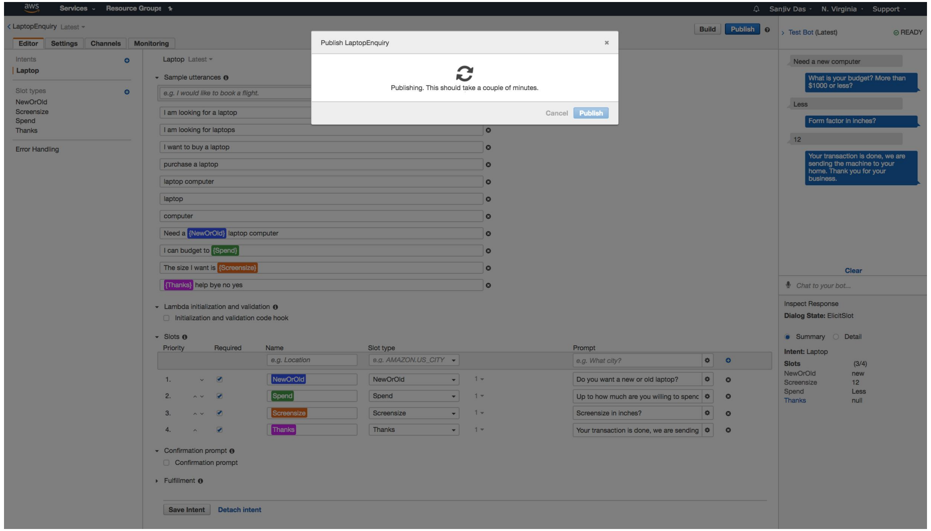
Dialog State: ElicitSlot

● Summary ○ Detail

Intent: Laptop

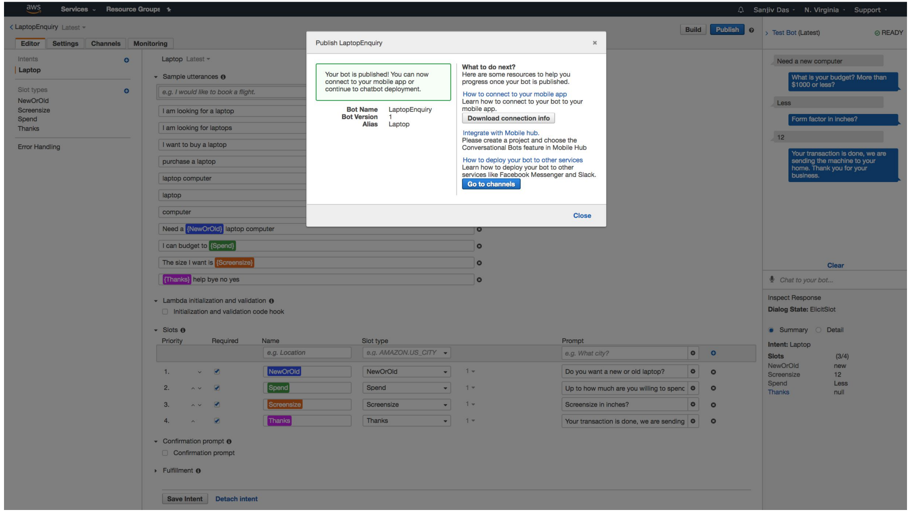
Slots	(3/4)
NewOrOld	new
Screensize	12
Spend	Less
Thanks	null

Publish



Publish LaptopEnquiry

Publishing. This should take a couple of minutes.



Publish LaptopEnquiry

Your bot is published! You can now connect to your mobile app or continue to chatbot deployment.

Bot Name	LaptopEnquiry
Bot Version	1
Alias	Laptop

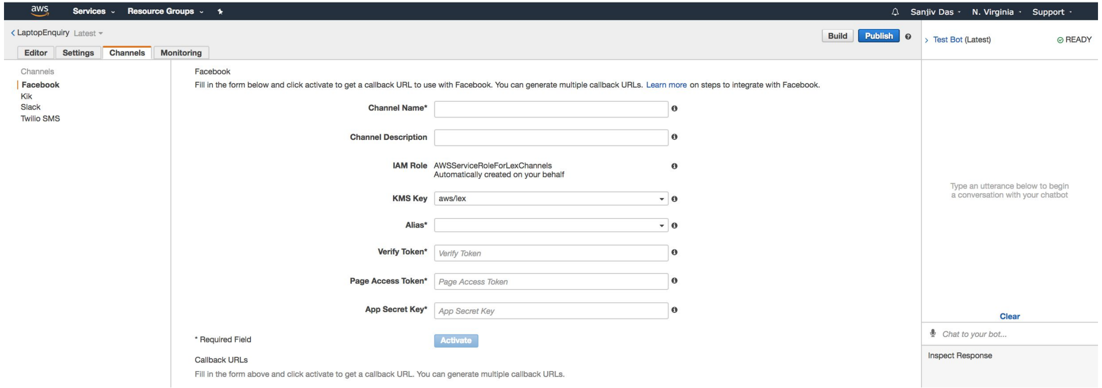
What to do next?
Here are some resources to help you progress once your bot is published.

How to connect to your mobile app
Learn how to connect to your bot to your mobile app.

Integrate with Mobile hub.
Please create a project and choose the Conversational Bots feature in Mobile Hub

How to deploy your bot to other services
Learn how to deploy your bot to other services like Facebook Messenger and Slack.

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



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*	Verify Token
Page Access Token*	Page Access Token
App Secret Key*	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.

Type an utterance below to begin a conversation with your chatbot