

Personalized Cook book using Alexa

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Abstract— With so many dishes and so many recipes available on the internet, it gets difficult to make a dish after looking at the recipe when you realize you don't have some of the ingredients. In this project, we have implemented a personalized cook book Alexa skill which does multi-shot conversation with the user and collects information such as available ingredients, desired cuisine and spice level. With the provided information, Alexa suggests the most suitable recipes and at the end reads out the recipe which is chosen by the user from the available options.

Keywords— Amazon Echo Dot, JSON, Amazon AWS Lambda, AWS SDK, Amazon cloud watch, Amazon DynamoDB, Java 8, Alexa Skills Kit

I. Introduction

We have developed a conversational Alexa skill which can help anyone with preparing their meal.

For e.g. -

Kelly is a working professional and works close to 10 hours a day. She comes home late and must cook a dinner.

Chris is a graduate student. He generally does not have time to cook at home. He prefers to have his meal outside. He decides to cook on weekend.

Chris and Kelly can use this cook book for quickly finding a recipe according to their choices. They just need to converse with Alexa and provide preferences related to the available ingredients, desired cuisine, and the spice level.

The conversation goes as given:

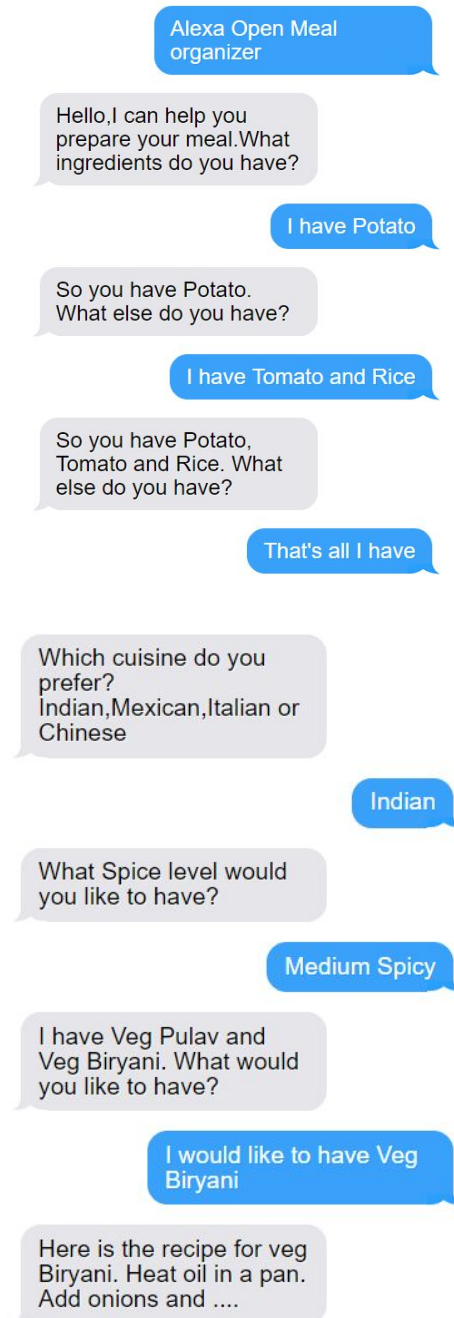


Fig 1. Conversation with Alexa skill (Flow Diagram)

For now, our skill shows recipes in the following cuisines

1. Indian
2. Italian
3. Mexican
4. Chinese

And the below spicy levels.

1. Extremely spicy
2. Moderate spicy
3. Medium spicy
4. Low spicy
5. No spicy.

II. TECHNOLOGIES

A. Amazon Alexa

Alexa is Amazon's virtual assistant. It has been integrated with many products such as Echo spot, Amazon echoes etc. We ask a question to Alexa with "Alexa" as an invocation word. AVS (Alexa Voice Service) is used to communicate with cloud-based services. The list of commands that Alexa understands is growing daily. There are over 25,000 Alexa skills. From tracking Amazon packages to paying bills, from ordering pizza to getting pregnancy advice, there are many skills available which can help us efficiently on daily basis.

B. Alexa Skill kit

The Alexa Skills Kit (ASK) contains many self-service APIs, tools, code snippets and documentation which helps us to build a custom skill. Alexa Skill kit aids developers in building engaging skills and reach customers through millions of Alexa enabled devices.

C. AWS Lambda

AWS Lambda platform is a part of Amazon web services which can be used for event-driven and server-less computing. Generally, AWS Lambda is used for building smaller applications while EC2 is used for building large-scale applications. Node.js, Java, Python, and C# are officially supported. Compiler tools like Gradle or Maven kit can be used along with it.

D. Amazon DynamoDB

Amazon DynamoDB is a NoSQL database service which is fast and flexible which can be used by applications that need consistent and single-digit millisecond latency at large scale. It is a cloud-based database which supports both key-value and document models. Its reliable performance, flexible data model and automatic scaling of throughput capacity make it a great fit for the web, mobile, gaming, IoT and many other applications.

E. Amazon CloudWatch

Amazon CloudWatch can be used as a monitoring service for various AWS cloud resources and the applications you run on AWS. CloudWatch enables us to track metrics, collect and monitor information about log files, set alarms, and automatically react to changes in your AWS resources. Amazon CloudWatch can monitor Amazon EC2 instances, Amazon Lambda, Amazon DynamoDB tables, also the custom metrics generated by our services and applications, and any log files our applications generate. We can obtain system-wide visibility, the performance of the application, and system operation health. We can use these insights to keep our application running smoothly.

III. IMPLEMENTATION

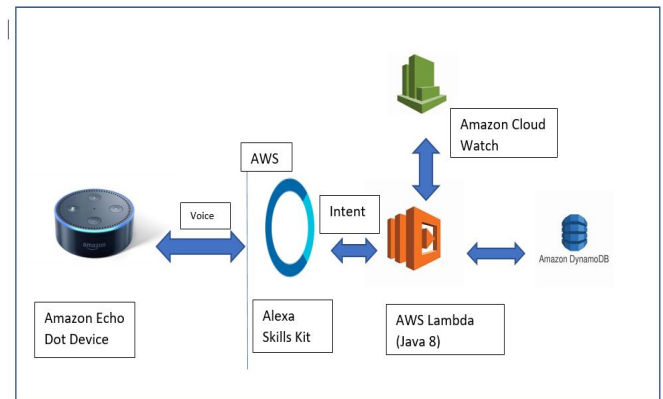


Fig. 2 Architecture diagram of the application

Fig. 2 shows the flow of execution between Amazon Echo Dot device and Amazon web service. To start with first Alexa custom skill "meal organizer" is set up in the Amazon developer console using Alexa skill kit. With reference to flow diagram described in Fig. 1 interaction model of our skill builds. Fig. 3 describes four implantation steps as part of skill builder.

Invocation name: It is the name to invoke the skill. The invocation name for our skill is Meal Organizer. So, to start a conversation with our skill, the user must ask Alexa to open skill by saying "Alexa Open meal organizer".

Intents, Samples, and Slots: Intents describes the core functionality of skill. As given in Fig. 4 total 12 intents are created. Out of which 6 are custom intent and 6 are Built-in Intents. The total number of slots is 4 with 4 custom slot types. Sample specifies the words and phrases users can say to invoke those intents. This mapping of

utterances to intents forms the interaction model for the skill.

Endpoint: Lambda function for our skill is hosted on region US East (N. Virginia). Lambda function is coded in Java. A maven project is created on eclipse using AWS Toolkit. The AWS Toolkit for Eclipse includes the AWS SDK for Java, to get started with building Java applications on AWS infrastructure services in Eclipse, including Amazon DynamoDB. DynamoDB is used to store slot values like ingredients, recipe name, and process that comes from external public API like yummlly. Amazon cloud watch is used to maintain AWS service logs.

Skill Builder Checklist
1.Invocation Name
2.Intents,Samples & Slots
3.Build Model
4.Endpoints

Fig.3 Steps involved in Skill builder

Custom Intents	Built-In-Intents
IngredientIntent	AMAZON.CancelIntent
IngredientFinishIntent	AMAZON.HelpIntent
DishIntent	AMAZON.StopIntent
CuisineIntent	AMAZON.NoIntent
SpiceLevelIntent	AMAZON.StartOverIntent
ThankYouIntent	AMAZON.PreviousIntent

Fig.4 Intents

In the future, we want to implement a web-crawler which will crawl web pages for recipes and add those recipes to our database. We want to make our database as exhaustive as possible with different kinds of recipes.

There can be a lot of exclusive recipes personal to each user which can be made with certain ingredients and we want this to be available for our users. So we want to enable the users to add their own exclusive recipes as well.

IV.CONCLUSIONS

Meal organizer is an Alexa skill which provides the recipe process based on user preferences like available ingredients, desired cuisine and spice level. Alexa does multi-shot conversation with the user to understand his/her preferences. With meal organizer skill, Alexa tells the whole recipe process to the user in voice, which makes unique skill comparative to available Alexa skills related to recipes in amazon store.

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REFERENCES

- [1] <https://aws.amazon.com/cloudwatch/>
- [2] <https://aws.amazon.com/lambda/>
- [3] <https://aws.amazon.com/documentation/dynamodb/>
- [4] <https://developer.amazon.com/alexa-skills-kit>
- [5] <https://aws.amazon.com/eclipse/>