# *Alexa for Business*

## *Building an Alexa Skill for Individual Business Use*


Eric Lan
Masters Candidate, Dept. of Software Engineering
San Jose State University
San Jose, United States
chenlan0219@gmail.com

Tiffany Lee
Masters Candidate, Dept. of Software Engineering
San Jose State University
San Jose, United States
tiffany.i.lee@sjsu.edu

Prathmesh Parmar
Masters Candidate, Dept. of Software Engineering
San Jose State University
San Jose, United States
prathmesh.parmar@sjsu.edu

Divya Thazhathethil
Masters Candidate, Dept. of Software Engineering
San Jose State University
San Jose, United States
divyakalidasan.thazhathethil@sjsu.edu



***Our Alexa Skill is an implementation that can be used by any software with Alexa application capabilities (Alexa, Echo, Echo Dot, Fire Tablets, etc). The intended purpose of our skill is to allow Amazon Sellers – eventually, online small business owners in general – to gather hands-free information that they otherwise would have to gather manually, by means of the Amazon Seller Portal. Our skill would be able to be used on multiple Amazon devices with Alexa capability, to easily recall and query data for sales and product information connected to the skill's database. This skill will help Alexa's transformation into a business-friendly device, useful and convenient for those on-the-go or those that are handicapped/disabled.***



***Index Terms*— Alexa, Echo, Amazon, Internet of Things, Smart Device, Intelligent Personal Assistant**


## I. Introduction

### *A. Background to our Skill Set*

In creating our Alexa Skill, we realize that 'Alexa for Business' is a relatively new term. Currently, there are many issues with Alexa – it does not support Wi-Fi meant for the public and businesses, and the Skills are enabled on Alexa are often extensions of an application that already exists on the App Store in iPhones and Android Phones [1]. Alexa's most popular features are often not Alexa specific and do not engage Alexa users in a specific way that showcase the specialization and potential Alexa could be used for – in our case, for business applications.

Amazon is rated the 4th most popular website in the United States, with a vast reach [2]. Millions of users buy and sell on Amazon every single day and it has revolutionized the way we make our purchases on the internet. However, there have been complaints that came with such a rating. Many find that Amazon Seller is difficult to use and that getting inventory and product reports still take up to 20 minutes to generate according to the Seller page. It can be frustrating to select the correct dates and fetching specific information can take a lot of time and be very taxing, especially if the individual makes lots of sales per day. We built out skill with this background in mind, to improve the user experience behind-the-scenes of selling products on these sites.

### *B. Preface in Implementing our Skill Set*

In creating our skill set, we thought to showcase the usages that Alexa could bring to the table with its ease of use and applicability. Amazon's Alexa and its corresponding devices are very well known and easy to use, something that anyone can buy. Amazon's devices that carry Alexa capabilities were the most popular devices that were bought this Black Friday and Cyber Monday 2017 [2] and there are more than 24 million Alexa devices in circulation [3], not including the Fire HD tablets that Amazon sells that are available to use with Alexa. These qualities as well as the fact that Alexa is very affordable in terms of technology, makes Amazon's Alexa a great hands-free device to commit our skill upon.

### *C. Our Target Audience*

Amazon's Alexa is currently used by individual households first and foremost, which makes the device a great carrier of our skill to our target audience. Our target audience consists of small and/or individual business operators that work through internet sales such as Amazon. It has been found that the majority of Amazon's sellers are individual operators – meaning they do not employ anyone to manage their online sales. Operators of these stores should have more time to concentrate on how to optimize their sales and to replenish their stock, not worrying about how to read a product table and figuring out how to mine valuable data that is not necessarily visible on Amazon's Seller Portal. There has also been found that a big number of online sellers have full-time jobs unrelated to their internet sales, meaning they are using online sales as a part-time hobby. Whether they work full-time or part-time in

online sales, these individuals are busy as they have to manage their own online stores and would benefit from a device that is capable of giving them real-time inventory, product, and sales data just by speaking a phrase to Amazon's Alexa device.

## II. Solution

Our entire project is designed around usability and accessibility. Traditionally Amazon seller had to query or search through the database to find out information regarding their sold products, our skill removes these boundaries to fetch and query information. Our solution is simple, Amazon seller must ask Alexa about respective information and Alexa will respond accordingly. For example, Alexa, how many products were sold today? Or Which payment is due this week? This way instead of searching through the spreadsheets or querying database they can just ask Alexa to find the information. So, the business owners who spent a lot of time querying and searching the database will be free from the burden and all they have to do is ask Alexa and rest is taken care of. Till now there has been no skill that have focused on small businesses, so this skill can have a huge impact on this side of sector. Each business will have a part of single large database system they just have to upload their CSV datasheet rest data security and consistency will be taken care of on our end.

### *A. Benefits of our Skill Set*

Our skill will allow for queries and real-time access to the database and sales information anytime Alexa access is available – including the Fire HD tablet, as well as the new home Alexa devices that are available. The freedom to access information will be very convenient for users as they will no longer have to go online and process their information on Amazon's Seller Portal.

Although a smaller market, we hope that our skill can benefit those with handicaps or disabilities, as it was discovered a high number of those with handicaps or disabilities work from home [6]. Alexa is a friendly system that allows hands-free access, allowing great convenience for not just those with disabilities but also anyone that is on-the-go, or perhaps busy with other plans. Alexa can provide a simple, quick solution to any query related to the database provided, something that the Amazon Portal does not provide even with the actual transactional and inventory information. Our skill provides solutions and answers to questions that go beyond the database – questions that you can query, or information that is not specifically stated in the data.

### *B. Potential Disadvantages of our Skill Set*

The setup required to use our skill might be confusing and frustrating for first time users if we are not careful with our integration. We must make the process seamless in order to capture our audience, and this process specifically aims at the integration of a user's database into our system. The current use of Zapier may prove difficult and permission may be required to use the service should our skill grow a larger clientele. This process must be streamlined, otherwise our main goal – ease of use – will be pointless.

There is also the potential that Amazon does not like the fact that we are taking valuable data from Amazon Seller Portal and disallow us to use such information in our skill. We have seen this happen before in popular apps in the App Store such as with Apple; or that Amazon Seller Portal will improve upon their applications or implement their own solution to allow database queries between the Seller Portal and Alexa, as they manage both entities.

The other disadvantage is that, of course, this skill is only available if the user owns an Alexa enabled device. Although Alexa is popular, there is always the possibility that the device will run out of style, or become replaced with competitors such as Google Home and other devices that have come on the market in the recent years. We have no plans to make our skill become compatible with other devices outside of Alexa.

## III. Technology Usage And Implementation

### *A. How it Works*

A user that would use our skill would need to have a database of information in such a format as the one Amazon Seller Portal generates for its users. The information would then need to be saved in a .csv file format to be exported into our database. Currently, we have decided to use Zapier, a free tool that provides automatic triggering of data into a spreadsheet that can be uploaded to a database. Zapier connects to Amazon Seller Portal so that anytime a transaction or update is made, it will automatically change it into the spreadsheet as well. We then take the spreadsheet and upload it into our database system so that we can query the data for Alexa to use.

### *B. The Alexa Skills Kit*

The Alexa Skills Kit was revolutionary and brand new to Amazon's collection of vast services. Alexa Skill Kit (ASK) is a collection of self-service APIs and tools that help create fast and easy skills for developers to create new voice-driven capabilities. Just few lines of code can easily integrate existing web service or entirely new experiences designed around voice control. ASK does not require the user to have any knowledge of speech. Amazon does all the work to hear, understand, and process the customer's spoken request so you don't have to. Best of all, all the code runs in the cloud so nothing needs to be stored [7]

The easiest way to build a skill for Alexa is to use AWS Lambda, an innovative compute service that runs a developer's code in response to triggers and automatically manages the compute resources in the AWS Cloud, so there is no need for a developer to provision or even to continuously run servers. Developers simply upload the code for the new Alexa skill they are creating, and AWS Lambda does the rest, executing the code in response to Alexa voice interactions and automatically managing the compute resources on the developer's behalf.

From personal experience, we saw how skill building is made fairly simple by using the Alexa Skills Kit setup in the developer portal of AWS. Amazon has set up an easy way for integration of developer skills. The easiest way to build the

cloud-based service for a custom Alexa skill is by using AWS Lambda, an AWS offering that runs your code only when it's needed to and provides scaling automatically, so there is no need to check provisions or continuously run servers. You upload the code for your Alexa skill to an Amazon Lambda function and Lambda does the rest of the work, executing it in response to Alexa voice interactions and helping the client by managing the compute resources for you.

Disadvantages come with the current Alexa Skill Kit capabilities however. As we have brought up earlier, it has been difficult setting up our database for interaction. We had to compromise as it is impossible for other users of our skill to set up a database of their own to connect so far, with the way that skills are made currently. It allowed us to come up with the idea to create our own database that users can connect with, but that was not without its difficulties. Our only hope is that Amazon will allow Alexa the ability for Skill creators to allow its users to link with databases themselves in the future.

While Alexa now offers 25,000 third-party skills, Amazon won't say how many of those skills include visual features such as videos, illustrations, and on-screen buttons. Because Alexa wants to be fully voice – no additives – Alexa wants to be independent of apps or things that can make Alexa seem more and more like an extension of an app on a phone instead of a standalone product. There are 16,000 Alexa skills with 0 reviews [8], and we need to make our skill stand out.

### *C. Zapier*

In creating our skill, we realized we would need a way to consistently and easily gather a client's database to upload to our skill's database. Because we have plans to expend outside Amazon Sellers in the future, we happened upon Zapier, a platform that allows a user to easily create a .csv spreadsheet that can be automatically uploaded to the database server via SQL Server Integration Services or other free services according to whichever database management system that will be used specific to the client. Zapier allows for automatic triggering and updating of the google spreadsheet – it can update the spreadsheet whenever a transaction has occurred for instance. Zapier has access to Amazon's API and a user can easily log in using their Amazon Seller account credentials to use this service. Should our skill require the use of Zapier for all account management in the future, Zapier has plans available for commercial use and the price of such could be factored into the cost we will push for the use of our skill.

### *D. Amazon Lambda Functions*

For implementing our Alexa Skill we have used amazon lambda function. AWS Lambda lets you run code without provisioning or managing servers. AWS Lambda supports code written in Node.js, Java, Python, or C#. It is possible to use Node.js or Python code in the inline code editor in the AWS Lambda console or upload it in a zip file. For basic testing, you can create your function that you want manually by sending it JSON requests in the Amazon Lambda console. We just have to upload our code and Lambda takes care of everything required to run and scale our code with high availability. The technology that we have used is NodeJS in the Lambda. Each Lambda function has a unique ARN associated with it which can be used to trigger that Lambda Function. This ARN was specified in our Alexa Skill Kit. The lambda function will run the code only when we need it and scales with our usage, so there is no need to provision or continuously run servers.

When using AWS Lambda, the client is responsible only for the code that they themselves have written. AWS Lambda manages everything else so it offers a balance of memory, CPU, network, and other resources in question. This is in exchange for flexibility, which means you cannot log in to compute instances. Unfortunately, a client cannot customize the operating system or language runtime either. (More will be mentioned in disadvantages). These constraints enable Amazon Lambda to perform operational and administrative activities on behalf of the writer, which includes provisioning capacity, monitoring fleet health, applying security patches, deploying your code, and monitoring and logging your Lambda functions[9].

Inside the lambda function we wrote the code to connect to a single database which will be used by small businesses. The intents were defined inside the lambda functions and accordingly query was written to fetch the data from their database. Our customers must upload their data in the form of spreadsheet in our database and rest will be taken care of by us. The lambda function will query data in the database and will provide response to Alexa. We created our custom intents to query in the database and give response.

## IV. Future Scope

Nowadays, there is already a large community of incredibly engaged developers building skills for Alexa, and Amazon is also awarding developers who use the Amazon Web Services Inc. Currently, our skill aims one-man business or small business owners who do not have time to continuously log in to the account and download inventory updates. Time is money, and our skill has a great potential to be scaled up for larger business. We are also planning to leverage machine learning to make the Alexa skill service continually adapt to user input and get "smarter, and other cutting-edge technologies such as speech-based natural user interfaces.

Since our skill plans to collect information from all the databases from the collective users that use our skill, we are able to provide analytics that Amazon does not provide sellers in the future. We can provide our users with information such as – how is our product doing compared to other products in my category? How competitive is our pricing? And other valuable business information that is not available on Amazon's Seller Portal.

Should we manage to gain access to ease of integration of database with other online seller websites such as Alibaba and Ebay, we hope that we will be able to serve those sellers with our application eventually as well. To broaden our seller databases would not only expand the use of our skill, but improve our analytics that we made provide to a broad range of

sellers. We can show analytics such as price comparison of a specific product across all platforms, and the amount of traffic and what website is more efficient in selling a particular product than the other.

Furthermore, as our skill is only currently a one-way interaction, as in it is only capable of listening to a query and responding, we hope to add two-way interaction with Alexa as well. Questions such as "Add 20 red jackets to our inventory" will let Alexa update your inventory in real time, onto our database.

## CONCLUSION AND RECOMMENDATIONS

The aim of our skill was to provide a simple and convenient to the small business owners for querying or searching data which we fulfilled by using Alexa. Our skill removed the boundaries of fetching and querying the information from database now the person has to ask Alexa to get the information. We would also like to expand our application in a such a way that it can have 2-way interaction and customer can add stuff in inventory by just asking Alexa.

Time is Money. There are thousands and millions small business online sellers around the world, and what they do all the day is to track their sales, access the transaction history, and answer questions for customers. Our goal Is to make the Alexa be your personal business manager. Basically what it can do is to fetch the information and access whatever you need to know about your business really quickly without spending a lot time on looking for answers when you are a business owner. The solution we provided is a great tool for small business owners who are too busy and do not have time to manage their business especially when the sales grow up.

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