NLP SMART ASSISTANT

IT INNOVATION INTERN @ CHICK-FIL-A
ATLANTA, GA / MAY 2019 - AUGUST 2019

CHALLENGE

Chick-fil-A operators often contact the corporate headquarter for questions and troubleshooting. In order to reduce the time spent on calls and resolve problems quickly, there had to be a better method for help desk responders to understand the conversation and provide answers swiftly. I was tasked ***to improve support center performance by streaming conversation and searching for pertinent documents.***

ROLE: FULLSTACK DEVELOPER

- Developed the assistant tool using React, AWS Transcribe, and ElasticSearch.
- Prototyped and wireframed the tool's user interface.

TOOL PIPELINE

This concept had been thought of at the Innovation Center, but its development hadn't begun yet. My intern coach assigned me to spearhead this project and provided a blueprint for the system (Figure 2a).

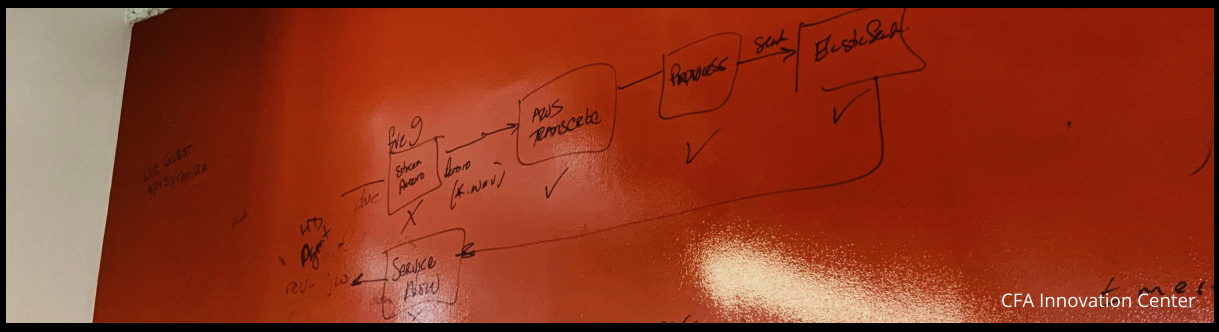
1. Audio Transcription
Audio files were easily turned into text by using Amazon Web Service Transcribe feature. It was connected to the backend using AWS Lambda.

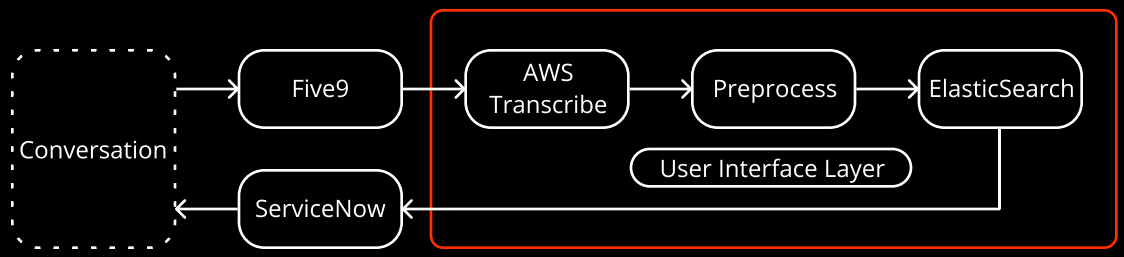
2. Natural Language Processing
To have better search results, audio transcriptions were preprocessed with Natural Language Toolkit. This allowed the text to be stripped down to fundamental keywords.

3. Document Search
Keywords were passed down to ElasticSearch to look for relevant documents that might be of use for the help desk responders.

4. User Interface
A simple React frontend was built to display audio transcriptions as well as the ElasticSearch results. This provided a way for help desk responders to interact with the tool.

Figure 3a: Pipeline Breakdown
My intern coach and I discussed and planned out the pipeline for the assistant tool. Outlined in red is what I have achieved during the internship.





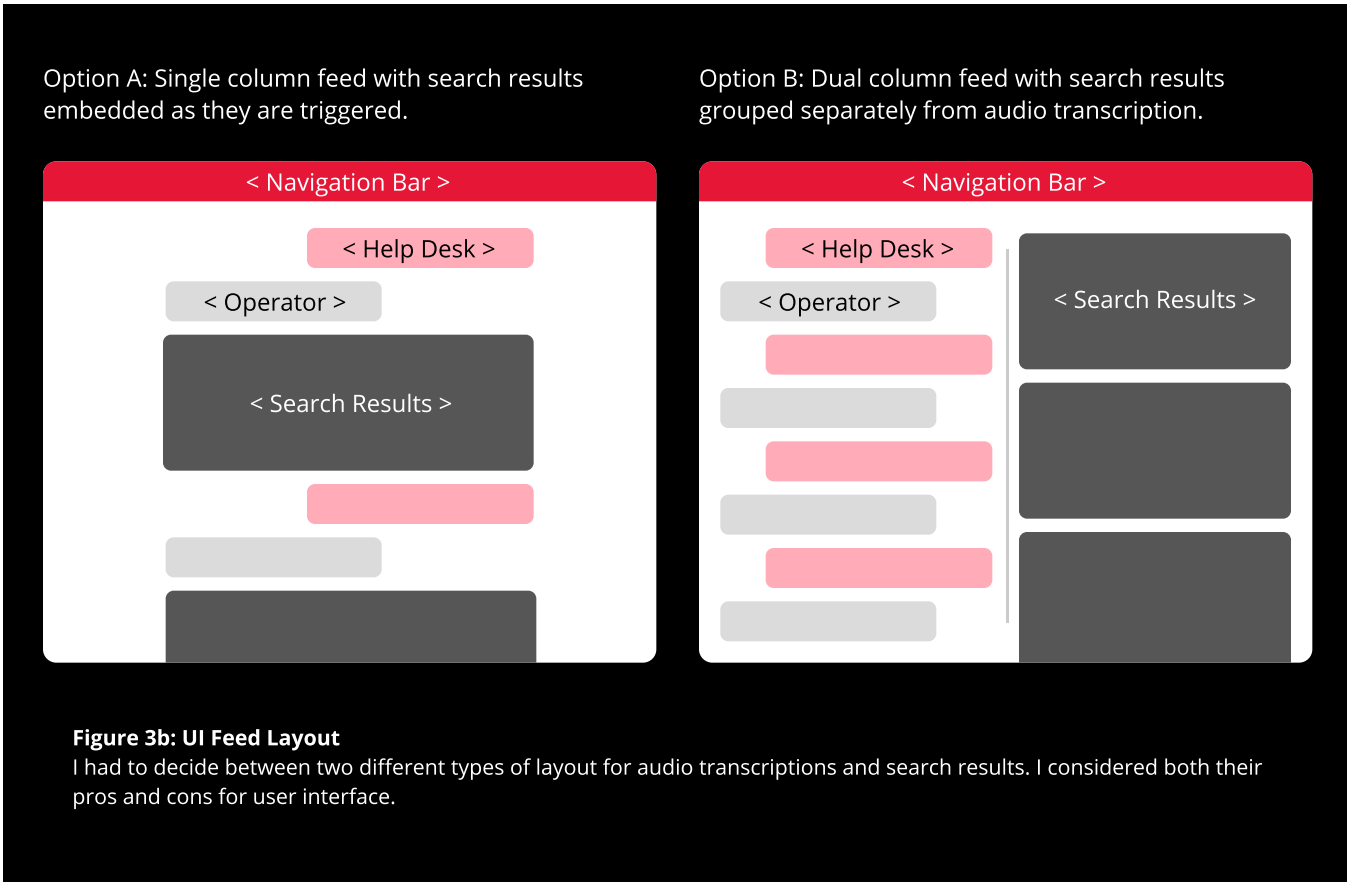


Figure 3b: UI Feed Layout
I had to decide between two different types of layout for audio transcriptions and search results. I considered both their pros and cons for user interface.

UI DECISIONS

There were some decisions to make when it came to creating the frontend of this project. The main component was how trnascription information and document data would be displayed.

Option A (similar to Siri) provides a simple interface and makes it easy for users to see which sentence or word triggered the search result. However, looking through results is difficult with transcriptions mixed in between, especially for long calls.

Option B provides an organized view relative to each section. It also makes better use of screen real estate. On the other hand, it is difficult to see which part of the conversation each result refers to.

After examining the pros and cons and listening to feedback from my coach, I ***decided to go with Option B*** since organization was crucial. Help desk responders are able to go back through the search results with more ease.

I went through a design iteration to make up for the weak point in Option B. As shown in Figure 2c, reference and link attached with each search result allow users to go back to the relevant sentence quickly.

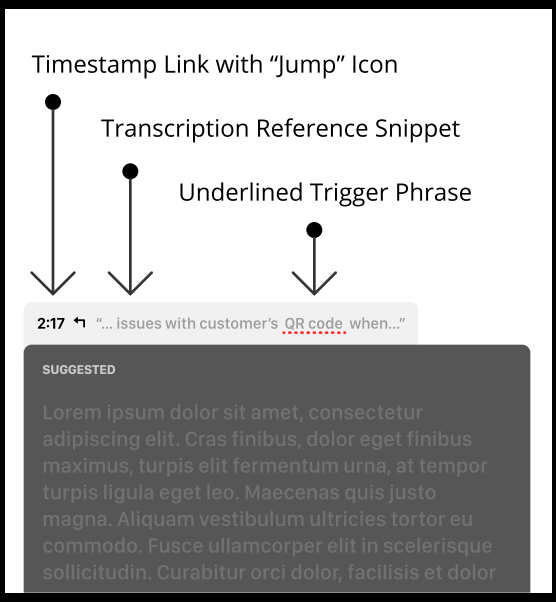


Figure 3c: Improved Search Result Component
Attached metadata enhances reference and navigation experience. Clicking on timestamp shifts the conversation section to the relevant part.

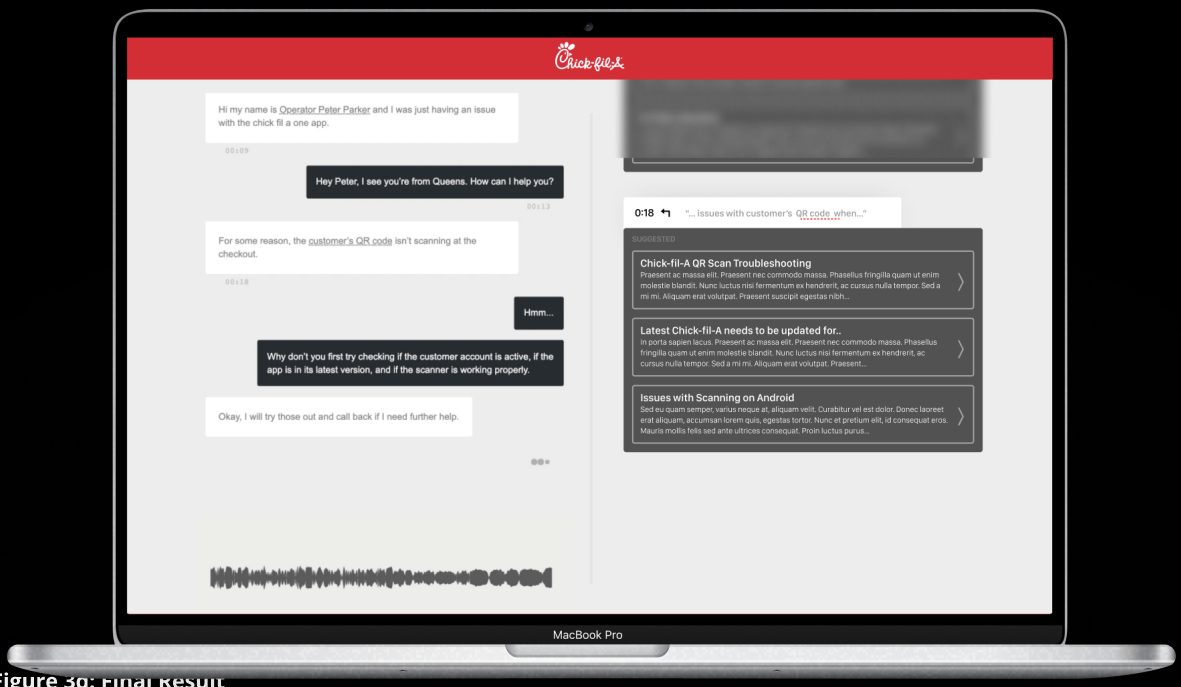


Figure 3d: Final Result
Snapshot of the final product in action. Confidential information has been blurred out or replaced with Lorem Ipsum.

Figure 3e: Awesome Summer Experience!
Not only did I gain amazing experience, I also met amazing friends and interns along the way! I also gained 20 lbs because the HQ food was so good...

OUTCOME

Given the scope of the project, it wasn't complete by the end of the internship. It still had to be connected to Five9 and ServiceNow. It also had a lot of bugs, and its natural language processing model had to be improved upon a lot more. Regardless, the end result was still a partially working model.

It was a unique project because it involved various types of technologies ranging from cloud services to artificial intelligence. It provided me a great range of exposure to existing tech and enlightened me on its potential.