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| **Senior Design: Adio** |
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| **Group Number** **19**  **Team Members:**  Sneha Advani, Bharath Jaladi, Arjun Lal, Romit Nagda, Sneha Rampalli  **Advisors**: Sangeeta Vohra |
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Abstract

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This document serves to describe the work done by Group 19 on Adio, which is an application for Uber and Lyft drivers to play their music during their shifts interspersed with location-based advertisements at a frequency they set.

Motivation & Goal

Advertisers, especially small businesses, want and need cost-effective ways to reach high-potential consumers. Additionally, there are currently cost-barriers for entry into advertising mediums such as radio for smaller businesses. Moreover, consumers want and need more relevant and effective methods to discover and connect with businesses that are easily accessible to them.

Most Uber and Lyft drivers play music on the radio, through which ads, earning revenue for radio stations, play every few minutes. Thus, our team wanted to take this advertising opportunity and improve upon it while also providing another source of income for these drivers.

No formal survey was conducted, but each team member spoke to Uber/Lyft drivers to gauge interest from their end. Specifically, we gave a one-minute pitch of our idea and asked for their feedback on the following points: (1) if they play any music while they’re driving their riders to see if most drivers would play ads during each trip, (2) if they would use the product, given the existence of products with similar goals, (3) if drivers would be interested in beta-testing our service. We received positive feedback from the drivers, as the use of this service requires little effort on their end, besides downloading the application. The only concern on their end was that the user experience could be reduced because of ads. However, drivers can set the frequency of the ads, and given the existence of Uber/Lyft ratings, the driver will be incentivized to balance the number of ads playing during each ride with the user experience.

We also spoke to our networks of family and friends to both hear their thoughts on our idea and explore any possible concerns they would have. The feedback we received was generally positive, especially amongst college students. Given that students on campus call rides to Center City Philadelphia for downtown events, it gives them an idea of activities in the area. Adults also expressed interest in this idea, for example, when they are traveling on business trips and want to explore the area around them during their free time.

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Below, we provide specific details on the stakeholders and value proposition of our product.

Related Work

To determine how to best differentiate ourselves, we did a great deal of market research to identify several competitors, listed below. We categorized competitors as follows.

**Table-based Rideshare Advertising:**

1. Octopus (<https://www.playoctopus.com/)>: provides free tablets to drivers that play trivia games and location-based video advertisements.
2. Vugo (<https://govugo.com)>: provides in-car entertainment in the form of video games, apps, film shorts, sports, and news.
3. Surf (<https://ridewithsurf.com/)>: provides interactive tablets for rideshare entertainment, such as videos, music, podcasts, live radio.

**Rideshare Billboard Advertising:**

1. Firefly (<https://fireflyon.com/)>: provides lighted billboards for the top of cars that cycle through different targeted advertisements in the area. Firefly pays drivers about $300 per month.
2. Halo Cars (<https://www.halocars.co/)>: provides LED billboards for the top of rideshare vehicles. Halo Cars pays drivers about $400 per month.

**Music Advertising Phone Application:**

1. Steereo (<https://steero.com/)>: creates playlists for drivers with sponsored music from independent artists paying to promote their songs. Steereo pays drivers once they have reached a minimum of $100 in earnings.

Given the current competition in our target market, we decided to differentiate our product in several ways that we feel are most beneficial to businesses, drivers, and riders. Firstly, our product is purely software-based and thus eliminates any hassle that may come with hardware solutions (such as billboards). Secondly, we integrated with the Spotify API to deliver ads that are interspersed with predetermined playlists set by drivers, which makes the experience more personalized. Thirdly, our solution allows for a passive way of making income for drivers. Lastly, our product will specifically be geared towards smaller businesses who typically do not get the exposure that larger and more well-established franchises receive.

We believe that these points make our product much more seamless and individualized than other solutions currently in the market. By catering to all stakeholders involved (small businesses, drivers, and riders), our product enhances the user experience on all ends.

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Components (Completed and In Progress)

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CC app developed with JavaScript, CSS, and AWS. At a high level, the mobile app allows drivers to sign in and set various parameters regarding the advertisements and music that they play, such as volume and frequency. In addition, drivers can navigate to a dashboard that details the amount of money made by drivers over specified timeframes, such as the past month or the past year. The web app is meant for advertisers and allows them to sign in, upload audio advertisements, and set the center and radius of the area their advertisements will be targeted towards (usually centered on physical locations of businesses).

Below, we list out the specific sub-components that comprise the mobile app and the web app, descriptions of their functionality, as well as their current status (**completed** or **in progress**).

**Mobile App**

1. Initial driver interface. This is essentially the home screen that allows the user (driver) to open the app and begin use of our product. **Completed.**
2. Settings interface. This view allows drivers to calibrate the settings that dictate how ads are played eg. frequency of ads, volume of audio, allowing location sharing, etc). **Completed.**
3. Profit dashboard. This view renders a gridded histogram detailing the amount of profit (passive income) made by a driver using our app specifically. In addition, it allows a driver to calibrate the time period over which profits are calculated and displayed eg. the previous year or the previous month. **Completed**.
4. Stopping/resuming a song with ads. This feature allows a driver to pause a song that is currently playing from Spotify, play an ad, and then resume the song. This particular feature is located on the settings interface described above. **Completed.**
5. Integration with Spotify. As referenced above, our product integrates with Spotify to play playlists that are actually curated by individual drivers, as opposed to being created by any third party. **Completed.**
6. Playing of ads after set number of songs. This feature allows a driver to connect to Spotify and only play an ad once a set number of songs have been played. **Completed.**
7. Integration with database. This component allows for the pulling of specific songs our of our database. **In progress.**
8. Driver statistics computation. This feature will provide specific calculations of statistics for drivers regarding profit/the actual rides driven and will then render the statistics to drivers. **In progress.**
9. Terms and conditions. These will detail terms of use on our app as well as what qualifications a user must have to join. **In progress.**
10. Geolocation algorithm for ad-selection. This will search through the entire database of ads that have targeting regions that encompass the current location of the driver and then selects these ads and queues them up. **In progress**

**Web app**

1. **Account creation**. This allows a new user to sign up and create an account with an email, company name, first name, last name, and password. We also implemented password encryption, using sha256 to create an unexpectedly unique 256-bit signature for a user’s password. This enforces security for our users, in case our company database is compromised by attackers. The npm packages used include: joi, crypto, and dynamodb. **Completed.**

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1. Verification of login credentials. This ties in with the above to verify that an email/password pairing does indeed exist in our database when a user is trying to login. The npm packages used include: joi, crypto, and dynamodb. **Completed.**
2. Map window for geo-location. This allows a user to click on a point of their choosing on a Google Maps API driven map. This click-point serves as the center of their ads’ targeting. Additionally, users can specify a targeting radius here. **Completed. [BHARATH INSERT HERE WHAT PACKAGES USED]**
3. Upload of audio files. This feature allows users to upload audio files (.mp3, .m4a) that contain individual advertisements. This involved transferring form data from the client-side to the server-side. Thus, businesses can upload the advertisement to our S3 bucket for later access and stores the ads’ metadata in dynamo db. The npm packages used include: aws-sdk, multer, multer-s3. **Completed.**
4. Evaluation of Completed Components

Below, we list out the various completed subcomponents of our product as well as the methodologies we used to evaluate them.

**Mobile App**

1. Initial driver interface. **Completed.**
2. Settings interface. **Completed.**
3. Profit dashboard. **Completed**.
4. Stopping/resuming song with ads. **Completed.**
5. Integration with Spotify. **Completed.**
6. Playing of ads after set number of songs. **Completed.**

**Web App**

1. Account Creation.
2. Password encryption. **Completed.**
3. Verification of login credentials. **Completed.**
4. Map window for geo-location. **Completed**
5. Upload of audio files to S3 buckets.
6. Demo

Below is a link to a video demo of both our mobile app and web app.

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1. Conclusions and Future Work

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References

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