INFO658
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THE DESIGN OF A GROOVESHARK MOBILE APPLICATION FOR THE APPLE OS

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Executive Summary

Using mobile applications on smartphones to access relevant and precise information is a rapidly growing trend. Apple’s iPhone has successfully capitalized on that trend, and a variety of companies are beginning to offer their products via mobile devices. A mobile application funnels focused information to its user within the environment to which they are accustomed. Mobile websites are constrained to the tedious Internet browser platform, while mobile apps give a user a greater sense of “in and out” gratification.

Grooveshark is a business prepared to give its customers the instant gratification they demand. As a competitive online streaming music website, Grooveshark offers customizable playlists, unlimited playback, and a social connection for music listeners of all kinds. Their full website offers a user-friendly environment and sharp Flash interaction, but desktop and laptop computers are not the wave of the future. Smartphones are the new computers. Given that Grooveshark has successfully created an app for Android, it is time for them to present an iPhone app that utilizes all the fun and sleek features made possible by the Apple operating system. Not only will our Grooveshark app take full advantage of geographic location, device orientation, and touch screen, but it will also bring forth the key features that are loved by the current shark community.

All Grooveshark members will no longer need to hoard music on their iPhones. With the advent of 3G wireless, it is easier than ever to access the cloud of information the Internet holds. Any user can access their own personalized music anytime and anywhere. Bus rides are no longer filled with boredom. Road trips can have their own theme song. The work environment may feel a little less tense with some background music to soothe the day. And downtime at home becomes a social event when Grooveshark is accessed.

According to our research, people who use online music streaming services express a desire for customized playlists, as well as streaming radio. They want to share songs they are listening to with friends. And the majority of users are willing to pay between $1-3 to utilize these features. All of these desires can be fulfilled through the Grooveshark iPhone app. Grooveshark may only be a budding
Grooveshark Mobile Application

business right now, but with a little time, planning, and marketing, it could bypass its competitors and gain a larger audience.

**Problem statement and Design Goal**

Mobile computing has become commonplace these days. Look around and you will see people carrying an array of mobile devices. People want to be connected and they want information at their fingertips. Smart phones and smart devices are replacing desktop and laptop computers at an astounding rate. According to Compete’s Quarterly Smartphone Intelligence survey (2010), people are using their mobile device throughout the day, and in a variety of settings (see Chart 1). As Luke Wroblewski (2011), a digital product designer, so aptly states, “when you design for mobile you are designing something that can be used anywhere, anytime, and be instantly shared/discussed with other people.” The smartphone market is booming and the demand for smartphone compatible websites and applications is high.

### Chart 1 from Compete Pulse

**How much time, throughout a typical day, do you spend using your mobile device?**

(Compete’s Quarterly Smartphone Intelligence, Jan-Feb 2010, n = 1246)

- **At home**: 16% (0-1 hour), 50% (1-3 hours), 26% (3-5 hours)
- **Misc. downtime throughout the day**: 20% (0-1 hour), 52% (1-3 hours), 24% (3-5 hours)
- **Waiting in lines or waiting for appointments**: 25% (0-1 hour), 59% (1-3 hours), 12% (3-5 hours)
- **While shopping**: 31% (0-1 hour), 53% (1-3 hours), 13% (3-5 hours)
- **At work**: 36% (0-1 hour), 43% (1-3 hours), 16% (3-5 hours)
- **While watching TV**: 38% (0-1 hour), 43% (1-3 hours), 16% (3-5 hours)
- **During my commute to work**: 53% (0-1 hour), 35% (1-3 hours), 9% (3-5 hours)
Joe Hewitt, creator of the Facebook app for iPhone, said that he was “convinced that it was possible to create a Facebook that was actually better than the website” (Wroblewski, 2010). Streaming music sites from the Internet are promising candidates for this theory during this current shift to mobile accessibility. And Grooveshark is no exception. As an online music streaming site that depends heavily on cloud computing, Grooveshark needs to expand its business to reach the mobile devices that people are frequently using to access the Internet. Grooveshark designers have developed an app for the Android Marketplace, but they need an app available in the iTunes App Store in order to overtake its competitors such as Pandora, Last.fm, Slacker, and Yahoo! Music; all of which are available for the iPhone. Grooveshark offers features, such as specific song selection, custom playlists, unlimited skip and replay, and social networking, which could easily dominate its competitors. However, without keeping up with current trends, Grooveshark could lose business.

Despite on-going legal issues which have challenged copyright laws with record companies, Grooveshark may still have a future in the mobile device arena, namely the iPhone. Our group has explored the possibility of targeting Grooveshark’s strengths and key features in order to create an app for the iPhone. Naturally, our navigational design strays from the current Android app due to the iPhone’s unique functions. We also wanted to offer a familiar design for the dedicated iPhone audience. The Android OS spans across a multitude of phone brands. The Apple iOS is exclusively on the iPhone, iPod Touch, and iPad, therefore, closing the door to a variety of problems that occur when offering a mobile operating system on different phones. Additionally, as Grooveshark expands its user base from Android devices to Apple devices, costs will even out to allow a decrease in monthly membership dues, therefore, ensuring an increase in members who prefer to pay less per month. The development of a Grooveshark app for Apple mobile devices should allow Grooveshark to increase its user base and increase revenue generated from new memberships.
Research

Market Research

In order to stay relevant and competitive in the market, Grooveshark needs to expand its mobile application business. Research has shown that Apple’s iPhone has cornered 20% of the mobile phone marketplace since its launch in 2007 (Veverka, 2010). The iPhone is also becoming a popular choice for a user’s next smartphone purchase among both present iPhone users and non-iPhone users (Whitney, 2011). With current apps for the Android, Blackberry, Palm WebOS, and Symbian operating systems, the creation of an iPhone app is the next step to increase membership and achieve Grooveshark’s business goals of becoming a top music site competitor.

In a study following smartphone users of all ages, ethnicities, and geographies, the most widely used entertainment application was Grooveshark’s main competitor, Pandora Internet Radio. “While many used this service on their desktops and laptops, the ability to access Pandora on their smartphone was a game changer” (Arbitron Inc & Jacobs Media, 2010, p. 3). As people make the switch from using their favorite websites on computers to using them on their smartphones, Grooveshark would do well to promote their smartphone applications to their current Internet users and encourage mobile use of the service. This would extend Grooveshark’s reach to many more environments besides the home or office. Research shows an increased desire for use of smartphone apps in their vehicles and a desire to replace other devices, such as GPS receivers and mp3 players, with a single device like the smartphone (see “AMS survey,” 2009 & Wortham, 2009). For these reasons and more, research confirms our belief that Grooveshark must invest in their mobile presence. A more in-depth research report can be found in Appendix A.

Current Grooveshark Android Application Analysis

Grooveshark currently offers an application in the Android market that requires a $9 per month VIP scholarship. In order to evaluate the current application several video presentations on the application’s features were consulted. A full analysis with screen captures is available in Appendix B. The main strengths of the current application are its clear global navigation menu and its use of large
clickable/touchable areas for all menu options. These design features will be central to the design of the Apple application. The main weaknesses of the current application are due to ambiguous and inconsistent labeling, particularly with the use of the word queue on some pages and not others. Our team paid special attention to consistent labeling and made labeling decisions based on a combination of the current application, the Grooveshark website, standard Apple conventions, standard music player conventions, and user research.

*Online Research*

In addition to direct user research, we conducted some guerrilla user research by viewing user-created videos on YouTube, reading comments on the Android Market page for the app and blog postings from tech news blogs and individuals, and searching forums for issues that users were having with the app. In videos, users highlighted the features that they liked or wanted to see. Comments from the Android Market and forum postings made it clear that the app was functioning inconsistently across the different devices using the Android operating system and that users don’t like the monthly price point. Blog postings from individuals and tech reviewers were generally very positive, especially noting Grooveshark’s key feature of allowing search and playback of specific songs.

*Use Cases*

Mobile applications are able to be used anywhere a cell phone can be transported. In today’s world that is essentially everywhere except while swimming in a body of water. Our research indicated that users may have different needs depending on where they were using their mobile music applications, and that certain areas such as in car usage may be increasing as Internet connectivity speeds increase on mobile devices and vehicle dashboard systems, such as Sync, become integrated with smartphones.

Our group chose to compose use case scenarios for different locations in an attempt to identify how location should impact design choices. Based off our market research of current usage trends we identified four locations where users are most likely to use mobile music applications: at home, in the car, on the go (during exercise, walking, or passive travel), and at work. These scenarios are located in Appendix C. The analysis of the scenarios informed our team that each location requires unique functions
that may not be feasible for the initial application roll-out, but they share common goals such as playlist generation and access, streaming radio capability, and customizable functions.

User Survey

Our team felt that the best way to reach a cross section of mobile music application users in our limited research time was to develop an online survey. A full description of survey methodology and analysis of results can be found in Appendix D. 47% of respondents currently use devices with the Apple operating system, and 42% of respondents currently use the Pandora application. This confirms our decision to design for the Apple operating system, and to use Pandora as a comparison point for application usage. The current Android Grooveshark application was only being used by 4% of respondents which clearly identifies a need for Grooveshark to expand to other markets.

61% of respondents ranked the ability to generate custom playlists as very important or important indicating that this feature should be implemented in our design. The availability of this feature should also be featured prominently in any marketing efforts. Only 17% of users rated social networking features as very important or important, and this may be due to the structure of the question. Respondents may not have understood that features like sharing songs with friends were social networking features. As our original design plan was to add these features, we included a question about which features would be most important to users. This question had the most impact on the design process, and the results can be seen in the following chart:
It is clear that users want social networking features in their music applications. Our original design plan included a location based feature that was dropped in favor of highlighting the items that respondents preferred, namely sending song recommendations, sharing to social networks, and seeing what friends were listening to. The survey results were informative and were completed in time for our team to incorporate them into our design plan.

**Design Recommendations**

Given the results of our research and the conclusions drawn from these various methods, we deemed it necessary to embrace the core features of Grooveshark: specific song or artist search and playback, genre radio stations, custom playlists, unlimited song/list playback, and social networking capabilities. In researching the market, we found that Grooveshark had invested in an Android app, which exhibits flaws amongst various phone brands. Grooveshark had once created an iPhone app that
was dismissed from the iTunes App Store, but our intention is to resurrect that idea with improvements. Online research justifies the need for a Grooveshark iPhone app to expand the member base and take advantage of a loyal audience of Apple users. Our use cases imply that our iPhone app must be flexible to meet the needs of various environments, whether the user is passively listening, or actively choosing songs. Based upon those use cases, we implemented a survey with those ideas in mind to pinpoint what our intended audience desired most. It was our survey that drew attention to how important custom playlists and sharing with friends is to potential members of Grooveshark. We wanted to give Grooveshark members what they love most, offer a sleek and reliable interface through the iPhone, and surpass the competition by offering features they lack.

**Key Features**

By creating an app for the Apple iPhone, Grooveshark hopes to reach a growing market of people worldwide, estimated to total about 256 million by the year 2015 (“Mobile Apps User-Base,” 2010). To download the app and log in to use it, a user must pay for a VIP membership. This will allow Grooveshark to cover music royalty expenses and leverage licensing deals with new record companies to increase the size of Grooveshark’s music library. Requiring membership for the app will allow it to remain advertising free, a key feature that could convert Pandora app users to switch to Grooveshark. Grooveshark can also collect data from a member’s use of the personalization features to improve the radio recommendation feature and genre stations. When a user votes “Hate it” or “Love it” about a song, this can be reported back to Grooveshark to help them tailor future recommendations. The app will get better at predicting a user’s tastes, hopefully leading to increased user loyalty and sustained membership enrollment.

As we mentioned earlier in design recommendations, our group had particular features in mind to fulfill business goals and user demand. To fulfill user demand our design must not only exceed user expectations of iPhone functionalities, but also include all the features our research indicated were
important. Our design offers four tabs on the bottom of the screen that direct users to a search function, playlist access, the presently playing song, and community connection. Search, playlists, and community are the core features that differentiate Grooveshark from its competitors, while “Now Playing” offers an expected functionality. While listening to a song, a share song button, intuitive for iPhone users, is available at any time. The inclusion of these features will allow Grooveshark to compete with other music apps, like Pandora, that do not offer social networking features, custom playlists, or unlimited playback of songs. And by surpassing competitors, we expect to fulfill our business goals. The details of our iPhone app design strategy and approach are covered in the next section.

**Information Architecture Design Strategy and Approach**

After formulating these key ideas of fulfilling our business goal and user demand, the next step in our process was to apply our research, coupled with the principles of information architecture, to our design. As mentioned previously, we decided to use the current Android application as a starting point for design as this application is rated highly by users (4 out of 5 stars in the Android Market). We also wanted to make sure to incorporate the symbols and design principles that are familiar to Apple users to increase the ability of novice users to navigate through the application.

One criticism of the current application was ambiguous and inconsistent labeling, and this was rectified in our design. The Android application places the global navigation menu at the top of the screen and we chose to place it at the bottom to make better use of the screen interface and to match user expectations for Apple app design. The current application uses the headings “Search”, “Playlists”, and “Now Playing” paired with iconic symbols for global navigation. We kept these headings and added “Community” to represent our addition of social networking features that are present on the Grooveshark website.

The limitation of four choices in the global navigation system achieves two design goals. The first is to constrain the options to meet the screen size of an iPhone or iPod touch, and the second is to help users cope with the paradox of choice. Ding & Lin (2010) detail several issues that arise from users
having too many choices (p. 59). These include being overwhelmed by choices (analysis paralysis), difficulty with assessing the quality of choices, regretting one’s decision, and escalation of expectations. To address these potential problems, we have limited the global navigation to only four options that users expect most from their music applications: to allow them to search for songs, play music, make playlists, and share their experience with friends. By having these four main objectives mapped to the global navigation, this should decrease the difficulty in decision making for users.

Another important principle in our design was the Principle of Least Effort which states that users will choose the course of action requiring the least amount of effort (Ding & Lin, p. 58). The most common objective of a user on the Grooveshark website is to find a specific song. To make it easier for a user to select this option, we decided to have the Search page as seen in Image 1 as the first page the application opens to, asking the question, “What do you want to listen to?” This option represents the goal of the majority of users of the application, especially first time users, and maximizes on the Principle of Least Effort.
The size and placement of the global navigation options were designed to apply Fitt’s Law. This law states that “the time required to move rapidly from a starting point to a final target area is a function of the distance to the target and the size of the target” (Ding & Lin, p. 73). The four choices in the global navigation bar are large and easy to touch without making mistakes. As the user navigates through the site, options on local pages are presented in lists with bars running across the whole screen as touch points. Our application also makes use of the common Apple swipe action to offer the user extended options, as shown in Image 2 and also in the complete series of wireframes in Appendix G.

Efficiency is important to all users, and especially to mobile users who may be accessing the app with limited time, many distractions, or while they are in motion. First, we designed for efficiency by using consistent labeling and carefully selecting navigation options. Next, we wanted to make sure users were presented with relevant options in the correct context. The “Song” page (Image 3) presents the user with a list of options for what he or she can do with that song. The list is ranked in order of user preference, making the use of the song’s menu more efficient. Similarly, the “Now Playing” page (Image 4, an example of our pixel perfect design) gives the user options for all of the possible actions a user may want to perform. They can play/pause/skip the song, add it to a playlist, love/hate it, or share it all from one screen. Users can quickly navigate the application and make all necessary decisions from one screen, thus increasing efficiency while on-the-go.
The labeling of options was done with careful thought about affordance. Affordance is the user’s perception of what can be done with an object, or in this case, what each navigation option can do (Ding & Lin, p. 75). We selected labels and icons that match user expectations of music industry terms and the Apple platform. The global navigation options all make use of standard conventions in labeling. The “Now Playing” page (Image 4) has a majority of these iconic options. The plus sign is commonly used by Apple to represent adding something to a list; the square with an arrow popping out is used to represent sharing or other extended options; and the use of the common play, pause, and skip buttons reflects those used by the majority of web based music players. The use of both implicit and explicit options should combine to increase the affordance of each option presented to the user throughout the application.

Even if an application is designed perfectly, users will still find a way to make mistakes. These mistakes can be even more common in mobile applications due to decreased screen size, virtual
keyboards, and users engaging the applications while in motion. Part of good design is designing for forgiveness, and making it easy for users to undo any mistakes they make. For example, the swipe feature can be used on the playlists to delete an item from the list. The “Now Playing” page allows the user to quickly add an item to their favorites and to quickly remove the item from their favorites. The global navigation options are consistent and allow a user to get back to any main page with one tap. The application also makes use of the built in page-back button common to most Apple applications (see Image 5). These choices were all made to increase forgiveness.

![Image 5](Image5)

Customized playlists and personalization are features that our users want and are willing to pay for. The main personalization option in our application is the streaming recommended radio. This option can be activated or deactivated with the iconic radio button on the “Now Playing” page. Recommendations will be based on both user preferences and genre of the songs in a queue. The main customization option in the application is the custom playlist feature (see Figure 3.1 in Appendix G).
Respondents to our survey indicated that creating custom playlists is an essential function of a music application, and is one that is missing from the most popular music application: Pandora. In our application users can either add songs to a Favorites playlist or make playlists with any songs they want and name the playlist with any name they choose. Users can also select from a list of genres and add them to their playlists, allowing users to have quicker access to their favorite genre stations (see Figure 3.2 in Appendix G). Another benefit to requiring membership, Grooveshark can continue to cover their music royalty expenses while leveraging new deals with more music companies, adding even more songs and variety to Grooveshark’s music library. The app will also be advertisement-free because of the revenue from membership fees.
Images 6 and 7 show the social networking options provided in our application that allow users to customize their experience. Users can search for friends and see what their friends like, post their current song to social media sites or email the song title as a recommendation to anyone with an email address, and edit their own profile to give them more control over their social experience (see Figures 5.3-5.8 in Appendix G for examples). These options allow the user to feel a sense of connection to the greater Grooveshark community and to customize their experience in new ways.

These features are easily accessible from any page within the app so that users can access them quickly and easily. Apple users will be familiar with the pop-up menu as this is a convention used by many other applications. The option buttons are large and easy to tap without error, and a mis-selection of the Community icon can be easily canceled on the pop-up menu. Each of the options also has a back button that will take users back to the Community pop-up menu. This makes it easy for user to correct any errors made during navigation. The Share button allows users to email a song to anyone using the built in iPhone email system without leaving the application. This function allows users to complete their action without losing their place in the application. As users may not be familiar with social networking options in music applications or design was created to make these options clear and easy to use.

Our design was focused on providing users with a fast and easy way to search for songs, make playlists, listen to streaming radio and share their information with friends. These four goals were the most commonly expressed by users throughout our research and represent the basis for the application. Once those goals were established, we put careful thought into how to best represent each functionality to the user. This was achieved through the use of careful and consistent labeling, limited decision options, and easy to use navigation controls.

**Deliverables and Visuals**

The process of designing deliverables was user-focused, iterative, and creative. Working with each type of deliverable gave us the framework to develop the next, but the insights from our user research and the collaborative process helped us refine our designs through successive revisions. We initially developed a blueprint (Appendix E) that sketched out the basic structure of the app, and then Grooveshark Mobile Application
created workflows that stepped through the user tasks as we saw them (Appendix F). As we created wireframes (above and in Appendix G), the close attention to how a user would interact with each screen made us revise our blueprint and workflows. Our pixel perfect designs (Appendix H) are the culmination of several design iterations. Although the first version of our app has been designed, we have begun looking ahead at what features will be offered in future versions.

**Three Year Project Roadmap**

To grow on the mobile platform, Grooveshark must have a paying subscriber base, and customers on Apple’s iOS platform have shown that they are willing to pay for services. While waiting for re-approval in the App Store and working out licensing agreements with major music labels, we will continue to develop the app and include new features. The monthly subscription fee potentially puts Grooveshark at a disadvantage on the mobile platform, but Grooveshark will use its strongest competitive feature--the ability to search for and play specific songs at any time--to make its app competitive with rival streaming music service Pandora. There are no plans to increase the monthly fee at this time and as the user base grows there may be an opportunity to lower the monthly subscription price, but we will continue to reassess the market and our costs moving forward.

The three year strategic plan includes upgrades to social networking functions including the ability to create groups of sharks, send messages within the app, and share to more services; increased connection to other content services including allowing users to create a widget from a playlist and post directly to Tumblr and WordPress (currently a desktop function that requires a cut and paste of code); and a major rollout of location-based services in two years time. At this time, our research indicates that users prioritize other social networking services over location-based services, but we will be ready as location trends up with users over the next few years. We plan to offer users the ability to see who is listening in their area, to see what’s popular both nationally and locally, and to pursue local advertising for highly targeted ad serving.
Another aspect of future design will be to maximize the app’s use in a vehicle while minimizing possible distractions. As car companies continue to integrate software into dashboard systems that communicate with smartphones and mobile applications, Grooveshark will aim to connect through this software and create a seamless experience within the vehicle. Future versions of the app will include the ability to control the app through voice commands, allowing the driver to keep their hands on the wheel at all times and still utilize the app.

**Future services**

*6 months*
- Add “Post to Tumblr” as option to Share functions
- Add “Popular” to Playlists and Search
- Add feature to send song by SMS

*12 months*
- Allow users to create a Widget from a playlist in the app and send directly to Tumblr and WordPress
- Users can create groups of Sharks

*18 months*
- Messaging to sharks
- Share to Shark groups
- Expand languages supported to include Arabic, Hindi, and others
- Expand Popular playlist to allow browsing by country

*24 months*
- Location services rollout:
  - What’s popular nearby
  - What’s currently playing nearby
  - Find sharks in your area
  - Broadcast your location and currently playing song to your sharks
- Integrate with major car dashboard systems, such as Sync (Ford) & MyLink (GM), to provide voice command controls

*36 months and beyond*
- Continued collaboration with other social networking services
- Beginning rollout of augmented reality features, i.e. a “lens” of songs playing, sharks nearby, favorite artists of sharks in the area, etc.
- Continue to implement features of full site in mobile app as this is where users will be.
What We Learned Practicing UCD

One way to think about User-Centered Design (UCD) is that “UCD is really about the design driven by user needs” balanced with business needs (Ding & Lin, p. 32). In developing our Grooveshark app for the Apple mobile platform, we incorporated business and market research with user research and combined them to create an app that would meet the needs of the user as well as the strategic goals of the company. We created use cases that informed our creation of a user survey; performed user research by watching user-created videos, reading reviews and forum postings, and conducting a survey; researched the market along with the recent history of the app and the company; and designed deliverables with user tasks in mind.

To get a sense of what the existing app is like, we searched the Internet for user feedback. Many people, both individual users and reviewers from supported tech blogs or tech news sites have posted reviews of the Grooveshark app and its many iterations. Most valuable to us were videos of users sharing the app in action and commenting about what they liked and what features they wanted from the app. Also helpful were comments on the Android Market and forum postings about what goes wrong with the app along with users’ complaints and compliments. After that, our first creative UCD exercise was developing use case scenarios. Thinking about where and how users would use the mobile app helped us get in a user mindset and focus on what users would want to do with a mobile app in different settings. This exercise also informed the survey that we conducted.

Before surveying users and potential users, we had several ideas about innovative features that we wanted to include in our redesigned mobile app, but the responses from our users made us re-prioritize some features. We decided to use the Search screen as a landing page, since the ability to search for specific songs was a highly desired feature for users, but also because the ability to play a specific song is what differentiates Grooveshark from its competition. In further analysing our user survey data, it became clear that we must provide quick access to custom Playlists and Genre Stations, as well. Originally, our team was very excited about adding location-based services, but the response from users and potential users in our survey data was less enthusiastic than we had expected. This is supported by the PEW report.
from November 2010 that found that only 4% of Americans are using location-based services (Zickuhr). We decided to push the implementation of those features further into the future and focus on the ability to share songs with friends via social networking and email, a priority for our users.

Our team felt that market research was a crucial part of the UCD process. The mobile market is rapidly growing and changing. Despite Android’s growth, Apple was first to market and has an incredibly loyal following of users. Research has helped us analyze the monetization of the app. We were worried at first that users of the free online Grooveshark site would not be willing to pay for access to the iPhone app. However, users of the Apple iOS platform have been shown to buy more apps than competing mobile operating systems like Android (Hansell, 2009). Perhaps this has something to do with the open Android market and the inconsistencies that can slip through in their apps’ functionalities. Through our research, we learned that Grooveshark has a strategic advantage over other music apps with the ability to play any song immediately, and there is an opportunity to position GS as an app that connects well with social networking and blogging services like Tumblr and WordPress.

Each of the deliverables we created focused our attention on the app from a different perspective, but the primary perspective was always about the user’s interaction with the app. Learning and using the language of Information Architecture was also invaluable. As we learned about the concepts of affordance, Fitt’s Law, designing for error, and the importance of clear navigation and labeling schemes, we were able to incorporate them to improve our design. Through the UCD process, we found ourselves working through multiple iterations of each type of deliverable: first creating, then sharing and evaluating, and then revising as we incorporated feedback from other members of the team. Creating process workflows made us think about the logical movement from one page to another, and creating wireframes forced us to think about how a user would want to interact with our design. Even creating pixel-perfect examples forced us to make design choices that would be aesthetically appealing to users.

For this project, our budget and time for user research was somewhat limited. To take the next step in User-Centered Design, we would like to share wireframes and possibly prototypes to users and
potential users to help validate our research and design. Further user testing could inform new iterations of our designs to continue meeting the needs of our users and goals of the business.
References


Grooveshark Mobile Application
Grooveshark Mobile Application


Appendix A - Market Research

Described as having “one of the most complete libraries of any music site” (Time Staff, 2010), Grooveshark is poised to be a major competitor for other popular online music sites such as Pandora. Currently, there is a Grooveshark Android mobile application, but in order to stay relevant and reach a larger audience, an iPhone application should be the next target for the business.

Smartphones have become the next boom in communication and information technology, with more than 4 billion mobile devices worldwide. That’s more than televisions, radios, or personal computers owned (Arbitron Inc & Jacobs Media, 2010). Apple’s iPhone stands out among the smartphone crowd. Since its launch in 2007, the iPhone is now predicted to have cornered 20% of the mobile phone market (Veverka, 2010). iPhone owners are increasingly loyal to the brand. In a survey by Zokem, “the iPhone took home a loyalty score of 73, far surpassing the score of 40 given to its closest competitor Android.” This loyalty score included participants’ preference for their next smartphone purchase; the iPhone was at the top of the “next purchase” list among non-iPhone users and present iPhone users (Whitney, 2011). Given the current healthy state of the iPhone in the mobile market, and its recent expansion to another large U.S. network provider, Verizon, we believe that the next natural step for Grooveshark’s growth is to have an application for the iPhone.

In fact, a Grooveshark application was already created for the iPhone. Unfortunately, it was taken down from the App Store by Apple due to a complaint from Universal Media Group in August 2010 and has yet to be reinstated. The complaint most likely stems from a lawsuit against Grooveshark over copyright infringement, brought on earlier that January by Universal Media Group, a leading music company (Billboard, 2010). Hopefully, this issue will be resolved quickly as Grooveshark has demonstrated it can strike deals with major record companies, such as EMI, among many others music labels (Marketing Weekly News, 2009).
In the meantime, our group has re-envisioned a new Grooveshark iPhone app. We are using updated research about mobile user preferences, business goals, and industry trends to inform our design. We are also incorporating best practices of information architecture to establish an easy-to-use interface and intuitive functions.

According to a Quantcast Audience Profile, Grooveshark’s monthly website traffic in December 2010 was about 250,000 unique visitors. A month later, the number of visitors more than doubled, resulting in about 600,000 people coming to the Grooveshark website (Quantcast, 2011). Another source estimates that more than 4 million people have used Grooveshark and have listened to more than 150 million songs a month (Office of Technology Licensing, n.d.). Of U.S. visitors, these groups of Internet users come to the site most frequently: people between the ages of 13-17, people of Asian descent, people with children between 0-17, families with a household income of $60,000-$100,000, and those with no college education. Of visitors worldwide, 22% are regular users, making up 46% of site traffic, while 78% are passers-by, making up 48% of site traffic. People who come to Grooveshark.com are also highly likely to go to other music websites, such as Rhapsody, Pandora, and last.fm (Quantcast, 2011).

Internet music websites are making their way into Americans online lives. In a survey by American Media Services, 47% of young adults ages 18-24 have listened to Internet radio, as well as about a third of all people under age 50 (2009). Not only are people listening to Internet music sites on their computers, but they are now making the switch to listen on their smartphones as well. In another study following smartphone users of all ages, ethnicities, and geographies, the most widely used entertainment application was Grooveshark’s main competitor, Pandora Internet Radio. “While many used this service on their desktops and laptops, the ability to access Pandora on their smartphone was a game changer” (Arbitron Inc & Jacobs Media, 2010, p. 3). As is shown by this research, Grooveshark would do well to promote their smartphone applications to their current Internet users and encourage mobile use of the service. This would extend Grooveshark’s reach to many more environments besides the home or office.

Grooveshark Mobile Application
A Grooveshark mobile application gives users access to music on the go, especially in the car or while traveling by other means. American Media Services found that 46% of people express interest in having Internet access inside cars, up from 37% in 2008 (2009). Some car companies are starting down this path, designing technology that can work with smartphones inside vehicles. OnStar, a service installed in some cars to help drivers with emergencies and directions, “will add MyLink, a group of Apple and Android smartphone apps that can be controlled with voice commands […] including] the ability to play back Web-based Pandora channels over a car’s stereo system” (Quain, 2010). Smartphone use while driving continues to occur, despite warnings that it is dangerous and contributes to accidents (Arbitron Inc & Jacobs Media, 2010, p. 3). OnStar and other in-vehicle Internet manufacturers believe that adding “voice controls will reduce the threat of driver distraction” (Quain, 2010). Acknowledging that their app will be likely to be used in a car, a Grooveshark iPhone app needs to have a simple user interface to reduce distraction while driving and possibly integrate voice command technology in the future.

Smartphones are also popular for people on the go because of ability of smartphones to take the place of other devices entirely, such as GPS consoles. Called the “Swiss Army knife of the digital age, […] about 80% of iPhone users get turn-by-turn directions from their phone, essentially replacing a GPS receiver.” This has huge implications for the future of smartphones to replace many other handheld devices, such as mp3 players. A Grooveshark app, with its unique feature of uploading your personal music library to the Grooveshark “cloud,” could accelerate this transition. As one smartphone user puts it, “I want to get into my car and do as few things as possible.” A Grooveshark app will further add to “the simplicity of having one device” (Wortham, 2009).

Grooveshark can capitalize greatly off of the popularity of mobile applications downloads, which show no signs of slowing down. In a market research report by Portio Research Limited, “the worldwide mobile applications user base is expected to grow at a [compound annual growth rate] of 37% between 2009 and 2015 to reach nearly 256 million by end-2015” and revenue from apps “will grow from USD
6.6 billion in 2010 to over USD 23 billion by end-2015” (Internet Wire, 2010). As this report shows, the expectations of business growth in mobile applications are huge. To stay competitive in the market, we conclude that Grooveshark must focus its future on creating intuitive, simple mobile applications across a variety of mobile operating systems. Getting an iPhone app in Apple’s AppStore is the next logical step for both users and the business.

Appendix B - Grooveshark Android App Analysis

Grooveshark currently offers a mobile application for the Android operating system. The application requires the purchase of a VIP Membership which costs $9 per month. Due to this limitation the authors of this report relied on video presentations of the features, processes, and functionalities of the current application. The Android application loads to the search page.

This page is very clear and presents the user with limited but useful options. The text on the home screen is unobtrusive to advanced users, but makes the capabilities of the search clear to new or novice users. The simple global navigation menu has large buttons which will decrease any user error in making selections. The iconic labels “Search”, “Playlists”, and “Now Playing” are clear and make use of conventional knowledge about the functionalities of music applications.
This is the screen presented to the user upon making a search request. The entire song bar is clickable which decreases the amount of fine motor control needed to make selections. The application requires you to take another set of steps to actually play the song, but in this case that extra step makes sense as adding the list of song options to the search results would decrease usability. One negative aspect of the search is that results are not sortable and it is not clear how results are ranked. A user may have to take extra steps to refine their search to find a song, especially if they know the artist but not the exact song title.
Once a user selects a song they are presented with this menu specific to that song. Again, the application allows the user to touch the entire bar to make a selection which enhances navigability. The options for each song are relatively clear, however users may be confused about the difference between a queue and a playlist. The global navigation menu uses the playlist label, but not a queue label. The queue option could be re-labeled as “Add/Remove from Now Playing” to decrease confusion about the affordance of this option.

The Now Playing screen is the busiest of all screens in the application. The user has a multitude of options for controlling the queue. The current song playing is highlighted, and the bottom of the screen shows the user’s place in the song. There are traditional buttons for playing and moving to the previous or next song in the queue. If the user has the Radio set to on, the application will continuously add recommended songs to the queue. The user can then mark the song with the heart button to label it as a favorite or they can select “Like” to confirm that they like that recommendation or “No Thanks” to skip that song. This mimics the functionality of Pandora, however users can skip an unlimited number of songs. If a user wants to control their entire queue they can deselect the radio option. This radio/non-radio functionality allows the user to have varying degrees of control which is ideal for advanced users, however the lack of clarity presented by this small button may confuse new or novice users.
The final main screen in the application is the Playlists screen. This can be accessed through the global navigation menu, and songs can be added from the menu options for that particular song. Each user will automatically have the “Favorites” playlist, and the consistent use of the heart icon throughout the application should decrease any confusion on other screens that rely solely on the icon. The user can generate and name playlists via the song menu, and can edit songs in the playlist by selecting the playlist title. Again, the application has large touch screen bars allowing for better motor control. This design is consistent throughout the application, and is one of the greatest strengths of the application.

The current Grooveshark Android application makes use of several important Interaction Design principles such as Fitt’s Law, efficiency, and forgiveness. The application allows for a high degree of personalization and customization. As mentioned previously, there are some labeling choices that could be made more consistent to enhance the affordance of options and some type of Help feature should be made available for new and novice users.

Appendix C - Use Cases

Home Use Case

A user decides to listen to music at home while they socialize with friends. The user logs into a music application on his mobile device because his music collection is stored on his computer on a different

Grooveshark Mobile Application
floor of the house. The user has several options for selecting music, he can search for a specific song, create a playlist, or listen to streaming radio. The user wants to start playing music quickly because he’d like to continue interacting with his friends, so he decides to use the streaming radio option. The user selects this option and is presented with several choices. He can pick a station based on a song, based on past preferences or based on a genre. Since he is in the mood to have fun he chooses the genre selection. He then scrolls down to “D” because he would like dance music. The user selects the Dance genre option and music begins to play. The interface offer simple controls for playing, pausing, skipping songs, and changing the volume. The user sets his mobile device down on the coffee table and resumes his socializing.

Car Use Case

A user gets into her car to drive to work. She uses the Grooveshark app on her smartphone because she wants to be in control of song selection (unlike radio) and only bring one device with her (unlike carrying both a smartphone and an mp3 player). Before she drives away, she decides she wants to listen to a Grooveshark playlist she made the last time she was on the Internet. Because the mobile app is seamlessly synced with the user’s website profile, she is able to find her playlist on her smartphone. The music plays in the car’s speakers because she has connected her smartphone to the car stereo’s auxiliary jack. The user places her smartphone in a stand on her dashboard for easy access if she wants to skip a song or pause it. If she receives a call through her smartphone while the Grooveshark app is playing, she can pause the music, hit one button to answer the phone, and talk through speakerphone, thus reducing distractions during driving and the hassle of handling several devices at once.

On the Go Use Case

A user commutes to work by bus every week day. He always has his iPhone, so he has downloaded a variety of apps to keep his mind busy during that 45-minute transit he takes each way. One particular app he often uses is Grooveshark. He likes listening to music on the way home to help him unwind. Sometimes he accesses his favorite playlist full of hand-picked songs. Other times, he tunes into a preset
jazz radio station as he transfers to a connecting bus. He really enjoys selecting a song that has been on his mind all day that he has been itching to remember all the lyrics. Fortunately, he can repeat “The Eye of the Tiger” over and over again as he heads home. Best of all, the Grooveshark app allows him to play songs in the background as he skims through the recent e-mails and tweets he’s received. This app has been a favorite of his for a few months now since he no longer has to use up all the memory of his iPhone with a saved music collection. He can access all his uploaded music on Grooveshark, as well as customized playlists he created earlier. It took little effort to compile these lists since he has a long commute anyway. He has time to make selections and share about his likes with his online friends since he is looking for distractions.

Work Use Case

A user is so glad she has access to Grooveshark on her mobile phone while at work because the site is blocked by the organization’s firewall. It’s great that she can use her headphones so her music won’t disturb her coworkers. In fact, having her headphones can help her block out some of the distracting conversations in the office. She really gets a boost from listening to music while she’s working and she has different playlists programmed for different moods at work. One for when she really has to focus, one for when her energy is flagging in the afternoon, and one full of songs like “9 to 5”, “Working in a Coal Mine”, and “I will Survive” for when things get really tough at the office. She really can’t spend much time at work managing her playlists, though, so she’ll often just choose a genre and let it play. It’s very convenient that she can quickly and easily add a song she likes to a playlist she’s already created or download it to her phone for later.

Appendix D - User survey

To better assess user preferences for mobile music applications our team developed a survey containing eight items. Two items were demographic, three items assessed current usage of mobile music applications, and three items addressed user preferences. The survey was distributed via Facebook by all
four team members, and was emailed to the team’s INFO658 graduate level class. Survey data was recorded for a one week period, and the survey had 61 total respondents.

The respondents varied in age, and the majority of respondents (62%) were between ages 25 and 35. 80% of respondents were female, and these demographics likely represent the limited distribution of the survey. The team felt it was important to discover which operating systems respondents were currently using, and these results are presented in the following chart:

Apple was the most common operating system, followed by Android. Several respondents reported not owning mobile devices currently capable of application usage, and the last 17% of respondents reported using a variety of other operating systems. It is clear that the Apple operating system is the most popular, therefore it is important for companies to ensure they have applications available for devices using this operating system.
Respondents were also asked to indicate which mobile music applications they currently use. Results of this question are presented in the following chart:

![Chart showing respondent apps currently used](image)

Pandora is the most commonly used mobile music application, and this confirms our decision to use Pandora as a comparison point for the development of our application. Several respondents reported having no currently used applications, confirming the results of the previous question about operating system. The current Grooveshark application is currently only being used by 4% of respondents. This low usage reflects the smaller portion of users with Android mobile devices and possibly the cost of the application. The team feels that the addition of a Grooveshark application for the Apple market will increase Grooveshark’s mobile application usage.

One of the areas of concern for our design was where users are using their music applications. Respondents were asked to label five location choices with their frequency of use: At home, At work, In the Car, During other travel (bus, train, airplane), and During walking or exercise. Each of these unique
environments inform design choices due to the constraints the place on the user. Results from this question are presented in the chart below:

Responses to this question varied greatly and confirmed our theory that users wouldn’t show a strong preference for use in any setting; therefore we designed our application to be usable in each of the five settings.

The next set of questions addressed user preferences for a mobile music application. These questions were designed to help our team learn which features and processes users found most important. Users were asked to rank the following features in terms of their importance: Custom playlists, Streaming radio, Recommendations, Search function and Social networking. Results of this question are shown in the chart.
The responses for this question were mixed, but users did show stronger preferences than for the previous question. It is clear that custom playlists are important to a majority of users, and that social networking features are less important. The decreased importance of social networking may be due to the fact that the most popular currently used application, Pandora, does not offer this feature and users are unaware of what social networking would mean for a music application. Although a majority of users rated this item as less important, some users rated it as very important and the team felt that another question could address which social networking features to include in the application.

To accomplish this goal a question was developed that asked respondents to check off which features they would want in a mobile music application: Posting songs played to news feeds on Facebook,
MySpace, Twitter, etc.; Tagging songs; Seeing what your friends are listening to; Seeing what people in your geographic area are listening to; and Sending song recommendations to friends. The results for this question are presented in the following chart:

Responses to this question show a stronger preference for social networking features, and sending recommendations to friends was the most desired feature. Our initial design plan offered this feature but
did not feature it prominently, and responses to this question encouraged us to make this feature more prominent.

The final question addressed the cost of the application. The current Grooveshark application requires a VIP membership which carries a monthly charge. To assess how much users would be willing to pay for this application, a question was designed that asked “How much would you be willing to pay per month for a mobile app that allowed unlimited streaming and downloads from over 2.5 million songs?”. Responses to this question are presented in the following chart:

![How Much Would Respondent Pay for Music Applications (monthly)](image)

Respondents indicated that they would be most likely to pay between $1-3 per month for this application. This was followed closely by $4-6 per month. The current Android application charges users $9 per month, which includes benefits on the full website as well. This cost may contribute to the comparatively
reduced usage of Grooveshark to the free Pandora application, and the cost of the application we are developing will be addressed in the project roadmap.

Appendix E - Blueprint

Numbers correspond to their matching wireframes

Appendix F - Workflow Diagram

Grooveshark Mobile Application
Please see the attached Microsoft Excel spreadsheet

Appendix G - Wireframes

Figure 1.1 Search Home

- The Search screen is the Landing Page when a user is already logged in to the app. Our user research says that being able to search for and play a specific song or artist is one of the most desired features.

- With the major navigation at the bottom, users also have quick access to their playlists and to genre stations.
Grooveshark Mobile Application

- Keyboard rises from bottom (typical for Apple apps)
- Search box stays in case user wants to revise search
- “flickable” list
- a tap on the song title will bring the user to the selected song page
- a swipe will bring up the most common editing tools.
- swipe brings up common editing tools: Add to playlist, delete from playlist, share, make available offline

Figure 2.1 Search in progress

Figure 2.2 Search Results
With a swipe, users can add to a playlist, delete the song from a playlist, share it, and make it available offline.

- Song can also be selected with sharing and editing options given their own button.
- Image would be cover image or generic music icon.
- Can tap image for more info about song and artist.
When the edit button is tapped, the grabber bars show up on the stations where the play icon is so the user can change the order of playlists/stations and the delete icon shows to the left of the station name.

Stations that have been added to the Playlists page show up here and can be moved like the user-created stations.

Favorites and Add Genre Stations won’t be movable.

When the edit button is tapped, the grabber bars show up on the stations where the play icon is so the user can change the order of playlists/stations and the delete icon shows to the left of the station name.

Stations that have been added to the Playlists page show up here and can be moved like the user-created stations.

Favorites and Add Genre Stations won’t be movable.
Figure 3.3 Playlist selected

- Shuffle option is available in playlist
- Swipe to edit is available for playlist songs
Figure 4.1 Now Playing

Figure 4.2 Add to...

Figure 4.3 Now Playing Landscape

- Typical music player controls (play, pause, skip)
- Options to love a song (adds to Favorites) and hate a song (skips and removes from rotation)
  - Plus button allows for adding to playlist or favorites
  - Radio on/off button is circled when radio is activated
- Share button familiar to Apple users to send songs to a friend

Figure 5.1 Community
• Creates a pop-up menu offering community options, as well as a forgiveness to navigate away (Figure 5.1).
• If they cancel, it defaults the user back to Now Playing.
• Landscape view possible with clockwise or counterclockwise turn (Figure 5.2).
• Find Friends (Figure 5.3) directs user to a search screen which allows them to find people in their e-mail address book or username. Then they can follow that user.
• Your Sharks (Figure 5.4) is the people a user follows. This button directs user to a screen that shows a list of sharks followed. Each name can be tapped to lead to a profile screen, or swiping finger to the left can delete that friend.
• Figure 5.6 illustrates a shark profile selected. Lists song likes (or dislikes). Add any of their songs to your playlist.
• Figure 5.9 illustrates the capability of editing one’s own profile via the Community Tab. Likes or Dislikes may be deleted.
Find Friends allows users to search for other members by username or email address

Your sharks shows users their current friends list
Selecting a shark from Your Sharks brings up a profile with songs they have listened to

Your Profile allow you to edit likes/dislikes and personal information
When top right pop-out arrow is pressed during Now Playing tab, a pop-up menu of sharing options is revealed with a forgiveness factor (Figure 5.8).

- Email opens New Message via iPhone Mail (Figure 5.9) without closing GS app.
- Facebook and Twitter are preset in iPhone settings with username and password for connection to share songs on these external services (Figure 6.1).
- When sharing through Facebook or Twitter, rotating wheel appears during wait. Then a confirmation box pops up when a song has been shared.
- Landscape is possible.
Settings (Figure 6.1) in iPhone allow options for the Grooveshark app. Options include login to Grooveshark account, Facebook and Twitter account login/connection, and color scheme selection. Figure 6.2 features first-time login when initializing the Grooveshark app for the first time, or when a user has logged out in settings.
Future Feature

- Future services are features that may be applied over time when members are more receptive to these ideas.
- Location services, such as who in your area is currently listening to what song, are one feature for which we are planning ahead.
- A green plus sign would allow you to add that song to your favorites. A red check indicates that song has been liked by you.

Appendix H - Pixel perfect

Please see the attached Microsoft Powerpoint presentation