# LOUGHBOROUGH UNIVERSITY

## GROUP PROJECT

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# Final Report

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# 1  Introduction

The **Hydra** project team involves 3 Computer Science masters students; Jay, Simon and Oliver. Being computer scientists, all members have a high interest in technology and a geek streak. All members have successfully completed an industrial placement, which lets them contribute the necessary skills towards this project.

The client for this group project is **Atos**. They are a world leading technology consulting firm who serves a variety of global market bases with annual revenues serving over several billion euros. This year as part of their annual IT Challenge, the realm to be explored is *connected living*. The team must deliver an mobile application which 'Enhances peoples lives through connected living'.

The definition of *Connected Living* differs from person to person, but Atos believe that it is homes, workspaces and cities all seamlessly connected through smart devices providing connectivity anytime, anywhere. Consumers are always wanting to feel more connected to their workspace, their homes and their cities. With this in mind, we have decided to take the approach of connecting people with music.

Imagine being able to control and connect with the music in your surroundings, anywhere. Imagine being able to walk in to a coffee shop, library, bar and restaurant and suggesting your favourite songs that then play through the public audio media. Choona is an app focused around the 'Connected Music'. Our research has shown there is no music sharing concept that allows people to collaboratively listen, interact and suggest music to people in your surrounding area, home or business through an intelligent, cloud-driven playlist system.

Choona is a public music player that lets you have a say in what you listen to in public. It allows you to suggest songs you wish to be played at your location either right away or at a specified time. It provides you with the option to like/dislike songs suggested by others. Furthermore, you can connect through your mobile device allowing you to listen to the music privately (via your headphones).

# 2    Literature Review

# 3  Idea Analysis

- User proposition

- Business proposition

- Business model

# 4 Literature Review

## 4.1 User Interface Design

Having read different articles relating to Human Computer Interaction components, several factors have been identified that directly link to improving interfaces of mobile applications. Some of these are the use of graphics, colour, font and other effects.

**Colour** is one of the main attributes and it covers many different areas including background, text colour and visual effects. Lets first consider background and text colour. There is a lot of different opinions on this topic; a lot of people will lean towards a light background with dark text. Dark backgrounds (dark designs) are becoming very popular now and add a creative and elegant appeal to the app. This is not something that can be left to preference. There are situations when dark backgrounds suit the app and there are situations when a light background is preferred. An app with lots of reading is better off having a light background with dark text. A recent survey was taken on this area and 47% prefer light background because it aids with*readability*. Another 10% said they prefer dark backgrounds with 36% saying it just depends on the function of the app [0]. With our app in mind, we are not so hung up on readability but eye fatigue. We want the user to be able to use the app in any conditions whether it be during the day, night, in unilluminated rooms (bars and nightclubs) or illuminated rooms. With this criteria in mind, we need to consider something that has not too high-contrast. We do not want a full white on full black or vice versa. We can use dark grey with off white and this will prevent the eyes burning out. One final note to make; darker backgrounds tend to use less battery. A test was carried out on an AMOLED screen and the results showed that 'mostly' white background use 1/3 more battery than black backgrounds [1]. Another test was carried out on a Nokia Lumia 720 (with WVGA IPS screen) and this used 6.37% more battery having a white background compared to dark background [2].

Now if we have the dark grey background, we need to consider other colours to use with the app. Blue is usually a popular colour of choice (the worlds favourite) [3]. Blue is the colour of the intellect and the mind. However, blue can be difficult to see on certain backgrounds as it tends to blend in. This is actually to do with our eyes. There are fewer photoreceptors that react to blue compared to other colours and they are not in the centre of the retina because it is sometimes hard to distinguish.

Lets consider another colour; orange is included in Ubuntu's colour palette as they believe it signifies a community feeling. There are many other descriptions of orange - it is classified as a warm colour, it radiates warmth and is often associated with energy, happiness, attraction, stimulation and comfort [4]. We want our app to have a community like feeling. This is an app for the public where they can talk through the language of music. Two other interesting words here are *attraction* and *stimulation*. Ultimately we want users to be attracted to our app, enjoy their experience and to keep using it. Although colour won't have too big an emphasis on this, a well designed app can and colour plays a part in this. Therefore orange seems to be a good colour choice. Colour can also used to convey information through visual recognition. A colour like green means on, safe, valid etc while red means off, danger, invalid

etc. We can make use of these colours in our app to provide information to the user. Talking of colour, one of the most important thing to remember is to not use too many different colours. We want to keep the colour scheme minimal. A busy colour scheme will obscure the dark background as the contrast will be too sharp. Therefore we shall stick with 2 different colours and a background colour.

**Font** is another important consideration. It is important to make sure the selected font is clean, crisp and works well with colours we have chosen. There are several areas to consider here; the first being weights. If we want to try and create contract and a visual hierarchy within the app, we can consider different weights such as light, normal, italics, bold and extra bold. Legibility is also important due to the number of small scree devices there are currently on the market. If we use a font that is hard to read when it is smaller, then our app design has a serious flaw. Therefore it is important to use a *sans serif font*. This type of font does work well with a dark background. he trick, though, is to put only larger text in serif fonts, so that the extra white space floods around each character and makes the text very legible.

There are several other key considerations. Consistency; the app should be as consistent as possible with commands and menus containing the same content and format. If there are buttons or features designed on one part of the app that act in a certain way, then if this button/feature appears somewhere else, it should act the same way.

## 4.2  Competitor

We have taken a look at other apps and services on the market and feel that nothing matches our idea. The closest service available is from **Sonos**. Sonos is a smart system of speakers and audio components that unite your digital music collection in one app and can then be controlled from any device. The rise of digital music has allowed for us to bring our music wherever we go, through media such as iPods, MP3 players etc. However, there hasn't been the same advancements in terms of systems that don't move around. 'Wireless' is the word that comes to mind when thinking of a solution. It is now possible to stream audio to a wireless device (speaker) and without compromising on the sound quality. Sonos provides the user with the ability to play music from a device wirelessly anywhere in the **home**. However, there are two issues with this; it is only available for the **home** and the consumer needs to purchase expensive **hardware**. The cheapest speaker available for purchase is £169. If you are a music-orientated person, you may wish to purchase their high-end hardware which can cost up to £1200. Unfortunately, Sonos does not support other wireless speakers. An adaptor can be purchased to allow these to be connected to their system, the *Connect* device, but this costs £279.

**Pure** have also moved into this market where they provide wireless speakers and hardware for *wireless music* in the **home**. They also allow you to purchase hardware to link your current speakers with their system at £69. This is much cheaper than Sonos but is still quite expensive. It allows the consumer to wirelessly play their music from any music app

or streaming service they want. **Bose** also provide a very similar service to Pure, but the hardware costs are more expensive.

From this, we can see that there are no services available for the wireless sharing of music outside the home. Our app would unite music into anybodys daily routine, whether this is at the office, coffee shop, restaurant as well as the home. We also want to make sure that no expensive costs are applied. Competitors can appear at anytime during the development of a project, so it is important that we keep looking for emerging competitors and that we can identfy how our product is unique to theirs.

## 4.3   Music Sources

In today's maket, there are many music sources available to an individual. We have virtual music from services such as 'Spotify', 'Google Music' and 'iTunes' as well as physical music on 'iPods', 'MP3 players' and other hardware devices.

**Spotify** is a music streaming service that offers access to a library of over 20 million music tracks with over 40 million active users. It is available across 58 markets including the UK, USA, France, Germany, Hong Kong and Argentina. It is available on iOS, Android, Windows phone as well as PC and Mac. One chain that is affiliated with Spotify is Costa. Costa have their own playlist that people can access from their device. **Google Music** is another streaming service and offers the same service as Spotify. Again, they have a large library of songs (around 18 million) and the service is available in over 57 countries on all Android devices as well as web browsers. A year ago, Apple's **iTunes** accounted for 75% of the digital music market and with a huge 575 million active users. Although this may have decreased slightly in the last year, that is still a large user base. As well as general users, Starbucks is affiliated with iTunes and use this service to hand-pick and play music throughout their stores. The idea of allowing customers to put forward their music preference may be of interest to a chain like Starbucks amongst others.

The above figures suggest that the music streaming industry is vast and that music is a part of many people's lives. Coffee shops have integrated these sources and music into their environment, but without the customer interaction. Choona would provide this interaction. Over the course of this project, we shall identify more sources because having more sources creates a larger user base as well as a better music library. We shall look at how the different sources work to try and make sure we have adaptors in place that can cover the wide variety of sources available.

## 4.4   Legal Issues

Music playing for customers or staff through media such as radio, MP3, TV etc. is considered a *public performance*. The *Copyright, Designs and Patents Act 1988* means that an agreement is needed from the copyright owner before the material can be played in public. A music license (PPL) will grant this agreement. In most cases, a license is required but there are a few instances when one is not required. One example of this is where PRS artists have waived their rights. PRS for Music represents the rights of over 100,000 artists in the

UK. It provides licensing to organisations to allow the playing, performing and availability of copyright music on behalf of the artists and overseas societies. The royalties are distributed fairly and efficiently. Another example is a hotel, guest house or B&B that has fewer than 25 rooms with no areas open to non-residents. Any business such as a coffee shop, bar or gym that plays recorded music in public will legally require a PPL. The likelihood of our service being used in places that don't have a PPL and require one is small. Most coffee shops, restaurants, gyms etc. will already have the license in place. It will be work places deciding to implement our service that will have to go about retrieving a PPL. As part of this section, we shall look at the process of obtaining a PPL, the costs involved and potential constraints.

[0] http://www.webdesignerdepot.com/2009/08/the-dos-and-donts-of-dark-web-design/ [1]http://www much-power-does-a-black-interface-really-save-on-amoled-displays.html [2]http://www.7tutorials.com/do-you-save-battery-when-using-dark-background-windows-phone [3]http://www.aliciacowan.com/social-media-and-digital-marketing/strategy-and-advice/social-media-giants-branding [4]

# 5    Requirements

# 6  Design

- System architecture

- UI Designs

# 7 Implementation

- Services, waterway

- API

- UI

# 8    Evaluation

- User testing

- Client feedback

# 9   Conclusion

- Learn stuff

- Market readiness