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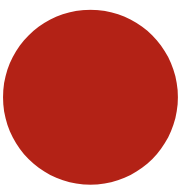
GAMIFIED INTERFACES AS A MEANS TO MOTIVATE EXPLORATION OF MUSICAL GENRES

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July 20, 2020

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Abstract

The internet is filled to the brim with musical content. This art-form has become so vast and so widely accessible that listeners find themselves overwhelmed with options. As a result, most of them unknowingly surround themselves with safe content and very rarely stumble upon something truly novel.

The purpose of this study was to infer whether a gamified interface based on a music genealogy map can be an engaging format to present musical information and lead users to remarkable musical discoveries.

A web-based prototype titled Soundventure was developed in tandem with this research and shared online to the general public. This concept rooted its structure on *musicmap*'s genealogy chart, and made use of *meaningful gamification* strategies to create a personal and appealing experience. Data collection on the website ran for two weeks and gathered information from 171 participants.

Results show that participants found the experience to be enjoyable and that it led to discover, and sometimes rediscover, music that they found to be remarkable, validating the implemented systems.

This study brings forth a promising method of active music exploration and highlights the potential for gamified applications to promote musical knowledge at large.

Resumo

A internet transborda de conteúdo musical. Esta forma de arte tornou-se tão vasta e tão amplamente acessível que os ouvintes são sobrecarregados com opções. Como resultado, a maioria deles cerca-se involuntariamente com conteúdo seguro e muito raramente se depara com algo fora do habitual.

O propósito deste estudo foi inferir se uma interface gamificada baseada num mapa de genealogia musical consegue apresentar informação musical de forma cativante e levar os utilizadores a descobrir música notável.

Com esta finalidade, utilizámos um protótipo web designado de Soundventure, desenvolvido em conjunto com esta pesquisa, que foi partilhado online com o público em geral. Este modelo baseou a sua estrutura no mapa genealógico do projeto *musicmap* tirando partido de estratégias de *meaningful gamification* para tornar a experiência mais pessoal e apelativa. A recolha de dados do website decorreu durante duas semanas e obteve informação de 171 participantes.

Os resultados mostram que os participantes acharam a experiência agradável e que esta os levou a descobrir, e por vezes redescobrir, música que consideraram notável, validando os sistemas implementados.

Este estudo evidencia um método promissor de exploração ativa de música e coloca em destaque o potencial do uso de aplicações gamificadas para promover conhecimento musical em geral.

Acknowledgements

First and foremost, I would like to thank Kwinten Crauwels and the *musicmap* staff for granting us permission to reuse their content. I cannot state enough how much this project relies on their work.

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On with the show,

Miguel Duarte

"ioioioioioi"
"oioioioioioioi"
"ioioioioioi"

Miguel Duarte

Main contributions to his mother's master's thesis
Typed on a computer at age 2

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Chapter 1

Introduction

With the advent of the internet and the extensively used streaming platforms, anyone can now have access to a vast archive of widely varied music. However, despite being motivated to explore new music, individuals are often stuck listening to the same type of music every day. The lack of means of exploration and the Filter Bubble phenomenon greatly contribute to this funneling of music culture. To counteract that, this study analyzes the current means and obstacles to music discovery and questions the potential uses and effectiveness of gamification as an actor to promote it.

Throughout Chapter 2, we will be taking a look at how music sets itself apart through both inherent qualities dubbed "intramusical elements" and extrinsic factors considered "extramusical elements". This leads us to two forms of music categorization - either through large extramusical categories (such as Folk, Art and Popular), or smaller *genres* that add intramusical elements into account. We then explore the realm of music genealogy as a way to highlight how music genres evolved in both amount and variety. Additionally, we take note of how these charts structure and visually represent musical information.

To further underline the problem statement, we go in-depth into how widely available music is today, what common problems do listeners run into, and what solutions have been tried to circumvent them. We go on to define what a music discovery is and why they should be fostered by taking into account the role they play in maintaining a healthy art system as well as their impact on the individual listener. We find that there is intrinsic motivation to explore and discover music and begin outlining a gamified solution capable of nurturing it.

Chapter 3 goes into detail about how we conceptualized, developed and evaluated our prototype. It summarizes how the study took place and what steps were taken to collect our data. We then present these results on Chapter 4, wrapping our analysis up with a discussion on the relevance of each statistic. Finally, on Chapter 5, we sum up our findings and review our process around this new information.

Chapter 2

State-of-the-art

Why are there so many types of music available nowadays, yet so few ways to explore that variety? How much music is out there that we would find enjoyable, yet are not likely to ever find? With this study we hope to find what goes into the discovery and exploration of music and if they can be facilitated with gamification strategies.

To proceed, we must first conduct an analysis on the history of music diversity so that an appropriate structure of exploration can be devised. To do so, we will go over the different elements of music and consequent categorizations. We will also be looking at the history of music accessibility so that we understand how people connect to music and if discovery plays an important role in that process.

2.1 Music Categorization

In our pursuit to efficiently explore music diversity, we must first determine what music is and how that diversity manifests itself. Music can be considered both an art-form and cultural activity that organizes sound in time as their medium. There are several elements that commonly define music, which can be **intramusical** (pitch, rhythm, timbre/texture, ...) or **extramusical** (place of origin, method of distribution, surrounding culture, ...). These are important to keep in mind as they are the basis used when setting different strains of music apart.

Before we fully dive into music definitions and boundaries we must first note that they are often either very vague or highly polarizing. With that in mind, this study does not aim to achieve the panacea under which all musical content abides by. It only needs to establish a coherent base language to operate upon.

On that note, the two main grouping methods explored in this study are **Philip Tagg's Axiomatic Triangle** and **Music Genres**.

2.1.1 Philip Tagg's Axiomatic Triangle

The axiomatic triangle is a distinction posited by Tagg (1982, 2000) where music is divided into three categories - Folk, Art and Popular - according to a set of *extramusical* characteristics shown

Table 2.1: Philip Tagg's criteria for the axiomatic triangle

Characteristic[a]		Folk Music	Art Music	Popular Music
Produced and transmitted by	primarily professionals		●	●
	primarily amateurs	●		
Mass distribution	usual		·	●
	unusual	●	●	
Main mode of storage and distribution	oral transmission	●		
	musical notation		●	
	recorded sound			●
Main 20th-century mode of financing production and distribution	independent of monetary economy	●		
	public funding		●	
	'free' enterprise			●
Type of society in which the category of music mostly occurs	nomadic or agrarian	●		
	agrarian or industrial		●	
	industrial			●
Written theory and aesthetics	uncommon	●		●
	common		●	
Composer / Author	anonymous	●		
	non-anonymous		●	●

a. In the 1979 version of this table two extra characteristics were included: 'general status of receiver in class society' and 'general relation between class membership of transmitter and receiver'. These have been subsequently excluded as too imprecise and problematic.

in table 2.1.

Folk music originates from traditional popular culture. It is typically of unknown authorship and transmitted orally from generation to generation (Kennedy and Bourne, 2004).

Art music describes thoughtfully cultivated music following a written tradition. Examples from this group are generally attributed to an author or composer. The term 'Art music' usually refers to western classical music, being often treated as synonymous to the term 'Classical music', but under this definition it may include written traditions outside of it (Glahn and Broyles, 2012).

Popular music is designed to appeal to a large audience and distributed widely by the music industry (Kennedy and Bourne, 2004). In this context, popular music is not the same as Pop music. The former is an extramusical umbrella that contains the latter in addition to several other music genres.

Tagg's axiomatic triangle and similar extramusical distinctions are useful to establish broader categorizations. We will be diving mostly into the Popular music group as we proceed through this study, but the same ideas could be applied to Art and Folk as well. For more in-depth subdivisions

we will be turning to music genres, which can, more often than not, fit neatly within one of the previous categories.

2.1.2 Music Genres

As defined by Samson (1989), music genres are categories that identify pieces of music as belonging to a shared tradition or a set of conventions. By this definition, both intramusical and extramusical aspects of each piece are being taken into account when identifying by genre.

We will be discerning the term "musical genre" from musical "form" and "style". We interpret musical form as referring to a particular structure, like the often used verse/chorus form or the sonata form. As for musical style, it will be interpreted as the assortment of intramusical elements typically associated with a genre or composer.

Examples of music genres are Rock, Baroque and Celtic Music which, when solely taking their extramusical aspects into account, could also be categorized under the axiomatic triangle as Popular, Art and Folk music respectively. Genres like these can be as broad or as niche as needed be. For instance, Rock music is a massive genre known for its use of electric and bass guitars joined by drum kits. But if we were to restrict a search solely to this genre, we would still be led to many different styles of music - some of which directly contrast each other. Such is the case with Glam Rock, known for its eccentricity and famous personalities, and the antithetical response found in Grunge, which focuses on nonchalance and distorted, negative emotion.

New genres can arise through the development of new musical styles and innovative ideas. These new styles usually appear under the influence of preexisting genres, although it is conceivable to create new music styles with no relation to existing genres. For example, electro-acoustic music came to be due to new possibilities derived from magnetic tape and electronic sounds.

Other times, genres can emerge by simply providing a name to an already existing style of music. If the naming gains enough traction, artists can be inspired to foster and further develop that particular style into a genre that stands on its own. Such is the case of Witch House, which began as a joke term applied to occult-themed dark electronic music yet somehow rose into popularity within internet subcultures.

Lastly, mixing characteristics from two or more genres can result in a new fusion genre. This can be seen in Jazz Rock, which is often just aptly called "Fusion". This genre takes traditional jazz elements, like characteristic melodies and improvisation techniques, and fuses them together with rock instruments and amplification.

It can be tough to keep track of all of these similarities, influences and designations. Fortunately, we can find a way to do so through genealogy charts.

2.2 Music Genealogy

When applied to music, genealogy is the pattern of musical genres that have contributed to the development of new genres usually in the form of written charts. Through them, we can see how

genres developed from each other, often including a few major figures for each of them. Since genres are subjective definitions, every chart has a different approach to display and organize these influences.

Studying music genealogy charts can be an effective method of learning how music genres connect and relate to each other. Hence why building upon these networks and understanding their structures may be valuable steps in this study.

For that reason, a brief analysis will be done of two genealogical projects and their charts; *ClassClass* and *musicmap*.

2.2.1 ClassClass

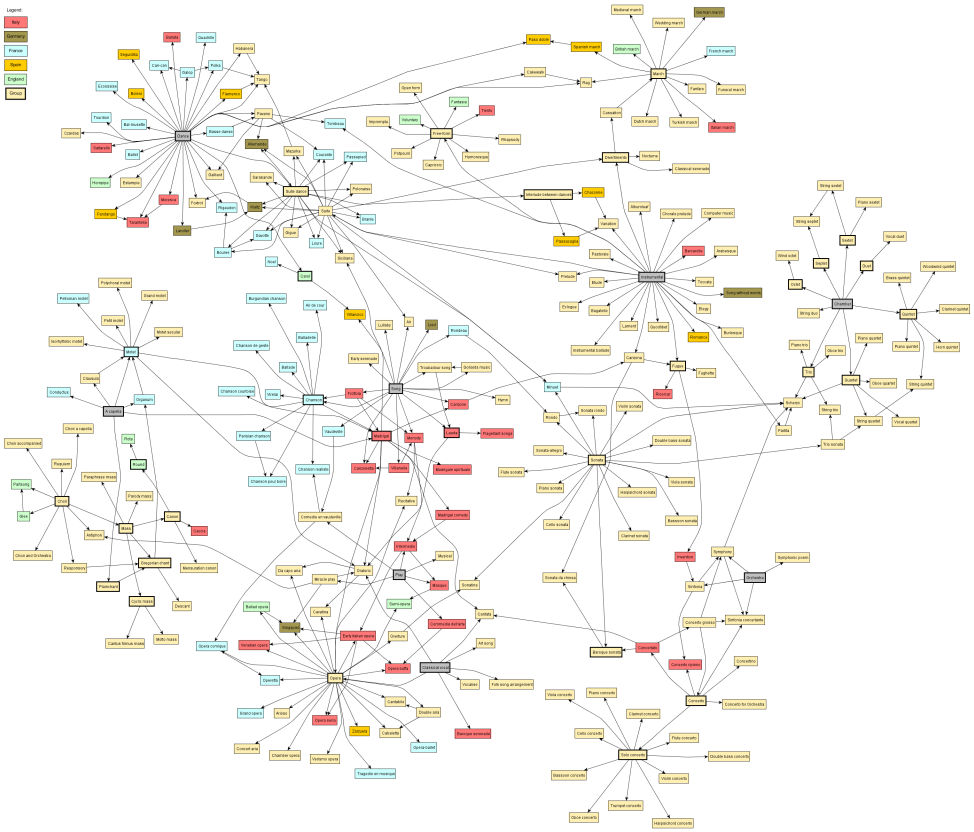


Figure 2.1: ClassClass's Chart

ClassClass is a genealogical project on classical music created by Arkhipenko (2016). Their chart (shown in figure 2.1) displays genres (and the groups they belong to) color coded by country of origin. When a genre is clicked, a sidebar appears on the right highlighting its assigned group as well as displaying a description and a playlist of musical examples.

There is also a timeline version which displays these same genres and groups chronologically on an horizontal axis. This paints a clear picture of how and when these genres got started and the way they interacted with each other. The timeline format is exemplified in figure 2.2.

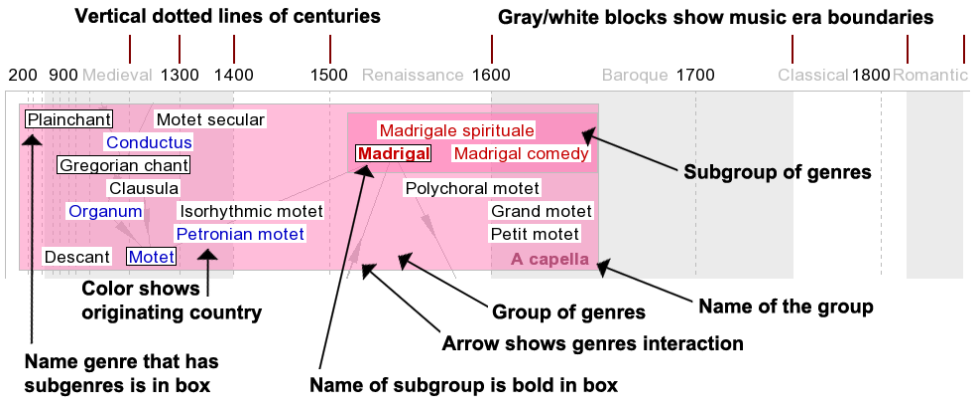


Figure 2.2: ClassClass's Timeline

2.2.2 Music Map

Musicmap is a genealogical chart by Crauwels (2016) that focuses on popular music while also highlighting a few influences from other music groups. These can be seen on figure 2.3, with the popular music group occupying the main center area and the remaining groups located above.

These groups are dubbed "Worlds" and they follow a similar structure to Tagg's Axiomatic Triangle, but add two additional categories and a few unique overlaps. These five worlds are then "Popular Music", "Folk Music", "Classical Music", and the new "World Music" and "Utility Music".

World Music is defined by them as the contemporary evolution of historical folk music. By their own admission, it is challenging to draw a difference between World and Folk music. The distinction is derived from the fact that music inside this group is contemporary, composed and performed all around the world, but not influential enough to become popular music.

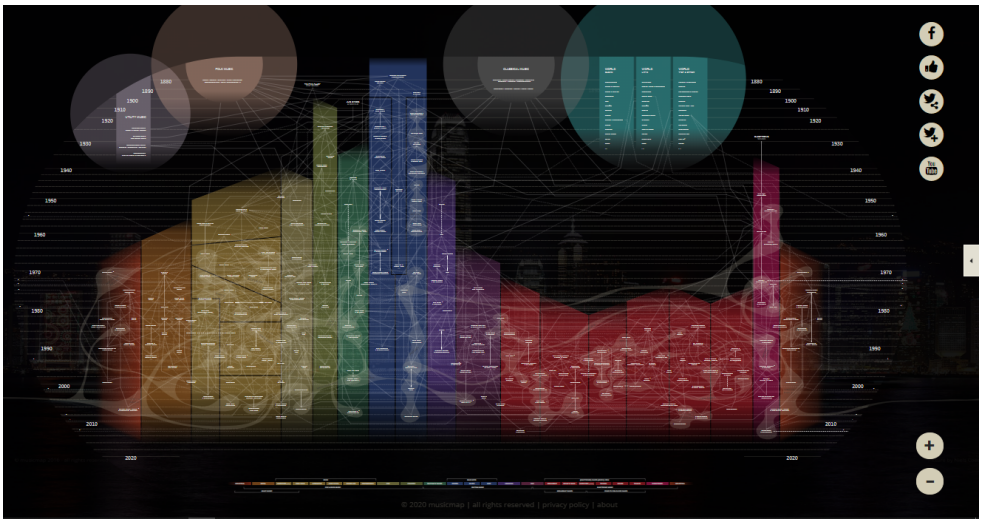


Figure 2.3: Musicmap's Homepage

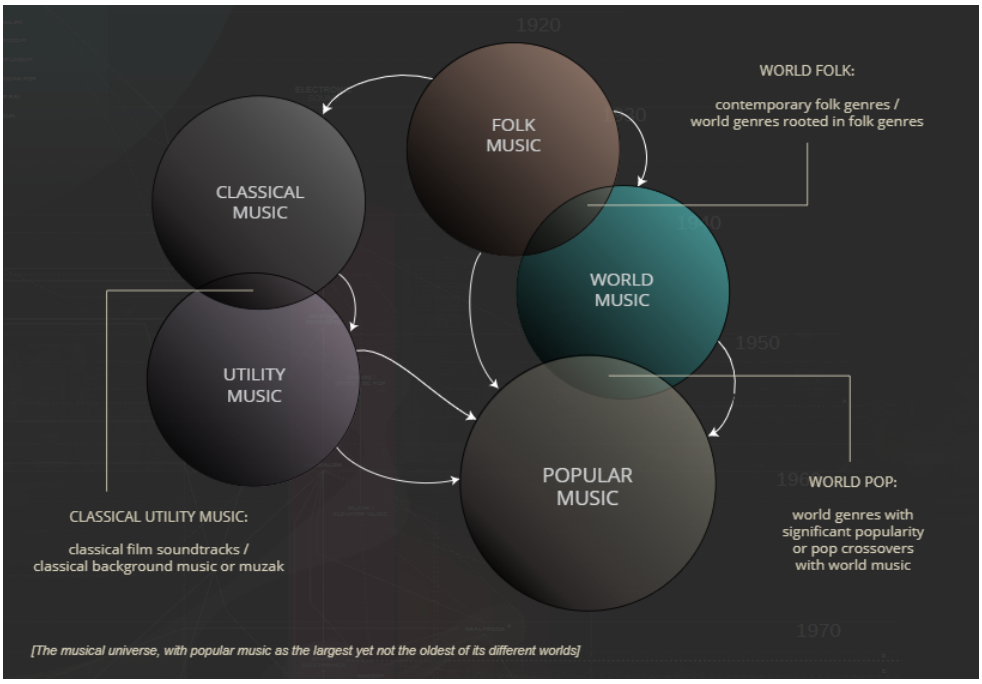


Figure 2.4: Musicmap Worlds

Utility music is only explicitly defined in this project as being influenced and overlapped by Classical Music. This *World* spans religious music (hymns, psalms and chants), military and march music, entertainment music (cabaret, vaudeville, musical) and soundtracks (film, TV, games and plays).

This chart features a very meticulous structure. Genres are grouped together into overarching families named “super-genres” which are considered to be their respective parent genre. These super-genres, in turn, can also be a part of groups called “primary genre clusters”. Clusters are categories that could have been their own genre but since they would be too large to accurately represent its diversity, they are broken off into smaller distinct super-genres. For instance, Rock is considered to be a cluster made up of six super-genres: “Rock ‘N’ Roll”, “Golden Age/Classic Rock”, “Punk Rock/New Wave”, “Hardcore Punk”, “Alternative Rock/Indie” and “Contemporary Rock”. All of these super-genres are color coded, with those belonging to the same cluster sharing the same color. Clicking on a super-genre reveals a side-bar on the left with a general description and a list of the genres within it.

The chart lays out super-genres in a rigid structure adjacent to each other. By using the top-down method, the older a super-genre is the “taller” it is represented. In other words, the horizontal axis determines the super-genre and the vertical axis determines the time scale starting from top to bottom. Outside of these axes, above the graph, the other music worlds are displayed so that some relevant influences on popular music can be identified.

When zooming in on the chart, genres contained within all super-genres and their network of influences become visible. Genres are placed on their perceived point of origin in time and

inside their respective super-genre. More than one genre can coexist at the same time within a super-genre, being shown side-by-side. Hovering over any of them highlights the influences on that genre alone, be that past, contemporary or future. Clicking on a genre reveals a side-bar on the right with a dedicated description as well as a YouTube and Spotify playlist of representative songs.

We now have a better understanding of how genres and their musical information can be structured visually. We have seen how this can be applied to more than one extramusical category, with *ClassClass* spanning over Classical Music and *musicmap* over Popular Music. This is useful information to have when designing an interface for active music exploration. Now, we shall take a look at how access to this content has affected both the common audience and the music art-system as a whole.

2.3 Music Accessibility and Dissemination

Before digital formats came into play, music began as an expression of cultural tradition. It was communicated through performance which would then be mimicked and arranged differently by the next performer (Small, 1998). From there, systems of musical notation began to be developed, turning pieces of music into tangible items that could be bought and owned, all the while establishing rules to write and read music. This gave rise to the notion of a composer - one who has written music under their name - bringing about development and support for individual signature styles. The same goes for professional performers, financed for their ability to interpret and skillfully act out these compositions.

Later on, technological advancements made it possible to record sound waves into physical media that no longer relied on a performer to reenact. They also led to the creation of radio by transmitting these sound waves through electronic signals over large distances. Each radio station - transmitting at a different frequency - would curate their own selection of music records, attracting and fostering different communities of listeners. As for their role as physical consumable media, records such as vinyls, tapes and CD's were considered a hefty purchase by the average consumer. This monetary limitation induced repeated listens of a rather small number of tracks, but it also led them to cherish this content and value certain aspects of music that much more. The selection was narrower, but the allotted attention span was much greater than it is today.

2.3.1 Digital and Streaming Platforms

Nowadays, like most types of media, music is more widely available than ever before. With the internet comes a far-reaching access to a diverse catalog of tracks. One of the main ways to browse through the available music is by finding it on any of the multiple established streaming services (Edison Research and Triton Digital, 2019).

To make a case as to how extensive the variety of music available on the internet is, look no further than McDonald (2013)'s *Every Noise at Once*. As of January 31st 2020, there were about

3,891 genre shaped distinctions on Spotify's streaming platform. All these genres are displayed in McDonald's project through one interactive webpage scatter-plot, distributing them by their common audio characteristics. They detail this distribution by stating that "The calibration is fuzzy, but in general down is more organic, up is more mechanical and electric; left is denser and more atmospheric, right is spikier and bouncier". To exemplify the page's appearance, figure 2.5 shows a version of this page in 2013 when it only had about 700 genres.



Figure 2.5: Every Noise at Once's scatterplot in 2013 displaying over 700 music genres

By clicking any genre, a user may instantly listen to a defining example of that particular class of music. By clicking the arrow next to the genre, the user is brought to a new page which shows its defining artists similarly mapped by their sound. They could then click an artist to listen to what they sound like or click the arrows to be brought to their Spotify page.

2.3.1.1 Personalization

With so much content available, it would be a daunting task to sort through all of it unaided, which is why platforms like these use recommendation systems. With these systems, each user is provided with unique suggestions tailored to their preferences. These can be determined by two forms of interaction, either implicit, which takes into account what the user mostly listens to and searches for in the platform, or explicit, in which the user actively rates by liking or disliking what they listen to (Allen et al., 2017).

However, there is a downside to this personalization. Most, if not all of these recommendation systems on the internet face an issue that is known as the Filter Bubble. Coined by Pariser (2011), the filter bubble is a phenomenon in which users become surrounded by information that fits their bias when using these personalization algorithms. The same thing happens in the realm of music streaming. Since these recommenders are shaped by the listener's existing tastes, most suggestions will fall under genres that they are already familiar with. This leads the listener to engage with these similar tracks, in turn perpetuating the filter bubble cycle by leading the system to recommend more tracks under that same genre (Allen et al., 2017). It becomes difficult to willingly explore or serendipitously stumble upon something truly novel since the system is not designed to match these results with the user. Thus, relying solely on personalization algorithms as they are would foster complacency in a listener's musical tastes.

2.3.1.2 Existing Solutions

To counteract the filter bubble effect, researchers attempted to design new algorithms and applications that diminished user bias. These were now developed with the concepts of serendipity and novelty in mind; The former being defined by the occurrence of an unplanned fortunate discovery, and the latter by the quality of being new, original or unusual.

Taramigkou et al. (2013) developed a web application that takes advantage of these concepts while also relying on empathy by having users experience other people's music perspectives. Their application aimed to create a bridge between a source user and a destination user based on their musical interests found on Last.fm's database. First, the source user would choose an obscure music genre out of a list of thirty. The app would then automatically choose a destination user whose interests closely resembled the chosen genre. This would generate a playlist that gradually transitioned from the source user's interests to the destination user's in hope that the former would become acclimated to the latter's musical perspective. That strategy deemed positive results as participants found a diverse pool of unexpected artists that they grew interested in listening and further learning about. It also served to highlight the usefulness of empathy and social relatedness

in the process of music exploration. Yet, we feel like generating playlists through serendipitous algorithms would still hinder the user's power of choice and that more active methods of exploration should be investigated.

Alternatively, if algorithmic systems do not engage the user in active exploration, why not look at genealogy charts or *Every Noise At Once* for that purpose? In a document detailing *Every Noise At Once*, McDonald (2013) states that "Maps are, after all, as much machines for getting lost as they are for finding yourself. [...] Follow any path, no matter how unlikely and untrodden it appears, and you'll find a hidden valley with a hundred bands who've lived there for years [...]. You might not want to abandon your old life and stay there with them forever, but you'll go home knowing that there are other ways to live." While Crauwels (2016), author of *musicmap*, states that "Thanks to a tremendous amount of links and a deliberate compact placement of music genres, people are motivated to track down other genres within areas they would normally not look." Both of these statements lead us to believe that these platforms are viable options for music exploration. McDonald's by allowing users to lose themselves in a massive map finding genres they never imagined existed and Crauwels' by placing related areas close together to tempt users to stray from their usual preferences. Even if these projects hold a smaller amount of options than streaming platforms, they should still be able to provide a healthy variety of choices to explore.

However, one aspect of these projects could be reworked in a different direction. According to Schwartz (2004) on the Paradox of Choice, an overwhelming amount of choices can be detrimental to a person's engagement. It often results in three negative side-effects: analysis paralysis, buyer's remorse and decision fatigue.

Analysis paralysis results from anticipated regret, in which an individual refrains from making a choice in fear that it will prevent them from having a better alternative. This leads them to abstain from any choice entirely. Buyer's remorse is essentially postdecision regret. It is taking a choice and later second-guessing that the alternatives were better suited. The individual grows unsatisfied with their choice, even if the others were not actually superior alternatives. Decision fatigue happens after making too many choices. After a certain point, the individual's energy is depleted and their capacity to make nimble decisions is significantly diminished.

To avoid all of these effects, we hypothesize that a guided experience with fewer options presented to the user in each iteration would be a compelling opportunity to consider.

2.4 Music Discovery

As Allen et al. (2017) state, based on Nowak (2016)'s work: *"A musical discovery is an event in which an individual finds a novel artist, song, or genre that fits their tastes and is memorable."*. They envision discovery as an isolated moment in time in which individuals come across something novel. This could either be something well-suited or terribly clashing with one's set of tastes. As long as it makes a memorable impact on the individual, it is considered a musical discovery. With that said, we would argue that discoveries extend beyond finding something new and unprecedented - they could also take place when revisiting something at a later date. As such, we

will be using the term *remarkable music* to include all of these cases. A discovery can then be either positively remarkable or negatively remarkable, based on how it measures against the listener's tastes. Lastly, if music discovery is a precise occasion, then music *exploration* would be the extended activity that cultivates such occasions.

To proceed with this study, the following questions must be asked: Is there a need to promote musical discovery? Do people really yearn for a variety of musical experiences, or would they be content listening to the same album on repeat for the rest of time? If so, then why is there such a wide range of music options being created and made accessible?

If we can understand why this variety already exists, then we are sure to find the vital role discovery plays in it.

2.4.1 Music Variety and Innovation

Tepper and Hargittai (2009) argue that, for an art system like music to stay healthy, audiences and consumers should seek out new artists. If they become complacent and there is no demand for innovation, then new artists and styles have no place to rise up to.

But that alone is no indication that audiences want novelty. This is where Tepper and Hargitai bring up the "Law of Variety" and a few other "variety-seeking" behaviour studies. This law introduced by Nassau Senior argues that "our desires do not aim so much at quantity as diversity" (Jackson, 1984), meaning that audiences would favor novelty over a large number of similar options. The studies noted (Tian et al., 2001; McCracken, 1990; Hirschman, 1980) also conclude that *"pleasure is derived from the act of stimulating choice, within limits, and discovering something new that satisfies one's preferences."*, while others (Hagendoorn, 2003; McClary, 1987) *"have long argued that variety, surprise, and the resolution of the unfamiliar are critical for enjoyment and deep appreciation of music"*. This leads us to conclude that people enjoy the incentive to choose and to find something through those choices, given that it fits their tastes. It should be noted that there is a deliberate use of "within limits" in this first citation which once again references Barry Schwartz's paradox of choice. Not only that, but when it comes to music, venturing into odd unexplored territories and finding how they tie into what one finds familiar fundamentally impacts how one perceives and regards music.

With that said, we can establish that music discoveries - and therefore the exploration that makes them possible - greatly enhance how one experiences music. But beyond this experience, there is also a social role that discovery plays into. By sharing content with others or displaying certain tastes, we establish a distinct social presence. This helps us foster relationships and influences our status and prestige in society (Tepper and Hargittai, 2009).

In other words, discovering music is not only a **pleasureful experience in itself**, it also serves as a **key source of social currency**. Knowing this, we can deduce that people can be intrinsically motivated to pursue new music tastes if given the chance. We should seize this educational opportunity by providing tools that promote said musical exploration. With them, we should aim to achieve three goals: **Guide music discovery** through a cohesive and sequential exploration experience; **Promote musical discovery** by enticing users to seek and delve into new genres on their

own volition; **Diversify musical discovery** by widening the range of potential musical interest through a compact array of diverse musical content.

Before we make a case for gamification, let us sum up what we have established so far. We have found that there is intrinsic motivation for music discovery, but current tools for exploration can be limiting. Streaming platforms constrict users, since their algorithms play into the filter bubble effect and promote a passive type of exploration. Other tools like genealogy maps and *Every Noise at Once* do a good job of providing musical information to the user. But they do so by offering too many options to choose from, which can be detrimental in keeping user engagement.

If there is intrinsic motivation but also a lack of engagement, there is an opportunity to apply gamification. Why not guide users through these maps, allowing them to explore and collect music genres filling them out along their journey?

2.5 Gamification

Gamification is defined by Deterding et al. (2011) as the use of game design elements in non-game contexts. It is an effective strategy often used to bolster engagement in a given activity (Kapp, 2012). However, it should not be used blindly as a cure-all solution. Buckley and Doyle (2016) note that engagement is only enhanced through gamification if the intervenient is already internally motivated to complete the task at hand. In this case, if a gamified experience were to be designed around music discovery, users would need an inherent interest in exploring music to stay engaged. But why does intrinsic motivation matter and what sets it apart from extrinsic motivation?

Intrinsic motivation is finding a task enjoyable and engaging with it for its own sake. Designing for internally-driven motivation often follows *self-determination theory (SDT)* which isolates three main elements: **Autonomy** - the feeling of being in control and able to direct your own actions; **Competence** - feeling capable of mastery over a situation or content to be learned; **Relatedness** - the feeling of being connected or "related to" others.

We can use these elements when designing a gamified experience to:

- Give learners a sense of choice and control;
- Provide learners with confidence in their ability to meet a challenge and accomplish a goal;
- Provide learners with a clear path to content or skill mastery;
- Reward learners for incremental learning as well as for learning terminal objective;
- Help learners feel connected to other learners through leaderboards, challenging of friends, and other methods of social interaction.

Extrinsic motivation is the will to engage in a task solely to achieve a desired end state. Strategies that rely solely on extrinsically motivational factors, such as rewards, are often criticized

for feeling artificially manipulative and lacking long-term effectiveness. But this does not mean it is useless in the realm of gamification. Extrinsic motivation can be effectively used to:

- Increase a learner's expression of task enjoyment;
- Increase a learner's time investment in performing a task;
- Strengthen the perception of freedom of action;
- Engage a learner when the activity is one that learners do not find of inherent interest or value;
- Engage learners when they initially view the activity as low value;
- Narrowly focus attention and shorten time perspectives.

However, the point still stands when it comes to long-term change. Using external motivators not only lacks in stable effectiveness, but it may also harm intrinsic motivation (Deci and Ryan, 2004). If a reward system is used to incentivize an already internally motivated behavior, that intrinsic motivation subsides. When the rewards are removed or no longer seen as valuable, the user will be less likely to engage in the behavior than they were at the start.

2.5.1 Meaningful Gamification

To prevent the aforementioned effects of reward-based gamification, Nicholson (2015) devised a system that builds upon intrinsic motivation. This meaningful gamification is meant to motivate long-term engagement with a specific context by helping a user find personal connections.

There are six concepts that make up the recipe for meaningful gamification:

Play – facilitating the freedom to explore and fail within boundaries.

Exposition – creating stories for participants that are integrated with the real-world setting and allowing them to create their own.

Choice – developing systems that put the power in the hands of the participants.

Information – using game design and game display concepts to allow participants to learn more about the real-world context.

Engagement – encouraging participants to discover and learn from others interested in the real-world setting.

Reflection – assisting participants in finding other interests and past experiences that can deepen engagement and learning.

2.5.2 Gamification in Learning

There are two types of gamification in learning defined by Kapp (2012): Structural and Content Gamification.

Structural Gamification is the use of game elements to propel a learner without any alteration or changes to the exposed contents. Changes are made to the structure around the content instead. This type of gamification often relies on points, badges, achievements and levels, along with other methods of progress-tracking. Besides being able to share their accomplishments, this type also includes other social components like leaderboards that incite competition. According to Kapp, structural gamification should be used to motivate learners to move through a curriculum and encourage them to return to it on a regular basis by engaging them with a reward structure.

Content Gamification is the application of game elements and game thinking to directly alter the exposed content. This type of gamification commonly uses elements like story, challenges, interactivity and feedback. Kapp states that content gamification should be used to motivate learners through engaging content.

Elements from both of these types are not mutually exclusive. One can add a story to structural gamification or points to content gamification. There should not be imposed limitations on which elements to use, these are merely guidelines on how they can be optimized.

2.5.3 Synthesizing a gamified solution to our problem

We have seen that there are two types of motivation to work with. We know that extrinsic motivation is useful, but can be harmful if relied upon too much. We have learned what intrinsic motivation is and how it can be developed through meaningful gamification strategies. We have analyzed two types of learning gamification that can cross elements over to create a hybrid educational experience. So how do we bring these together into one one gamified experience capable of inciting musical discoveries?

We propose to design a structured gamified experience using genre information from *musicmap* as our main source of content. The structure used in their map can be adequately adapted into a gamified experience, since it neatly groups genres together and links them through a very detailed network of influences. With this structure, we can allow users to unlock genres directly related to the ones they complete, ensuring a logical progression through the world of music. Users can keep track of this progression by simply looking at how much of the map they have explored and how much is left to go through. This information is further complemented through progression bars and other metrics for a more objective statistic. Some social components can be added as well, like connecting with friends, seeing their favourite genres on their personal profiles and receiving/sending suggested genres to them directly through the platform. These will be framed as optional forms of cooperation and not competition, as that might conflict with the users' internal motivation.

The structural elements end there as we bring some content gamification elements into the mix. We will be implementing very light story elements in the platform to further engage users. The

premise had them help a character put together a map of all the music available on the internet, which fits thematically with the subject of this project. As such, some descriptions found in *musicmap* may be altered slightly to fit with the exposition provided by this character.

Lastly, how well does our proposal follow the recipe for meaningful gamification? First, we will be looking into the concept of **Information**. On our platform we will be using unlocking mechanics as a method to progressively present music genres to the player. Initially, the player only has access to a limited pool of genres, beginning with a single one. After completing a genre, the player is given the option to proceed to any genre that is closely related to it, thereby expanding their options with each step. Next up is the concept of **Play**. By providing a network of contextually connected genres, we are facilitating player exploration within boundaries. In this case there is no proper way to fail, but we do allow players to course correct by using a key mechanic to unlock any genre in the map once a day. This leads us into the concept of **Choice**. Users are fully in charge of how they progress. They can choose from which genre to begin exploring and which paths to take from there, being entirely aware of where they lead. This exploration through genre-unlocking, together with the daily key mechanic, allows users to control their experience while still avoiding the negative effects of overwhelming choice. As for the concept of **Exposition**, we do have a story integrated with a real-world setting. The map that players are prompted to assemble with our character consists entirely out of music found on the internet, and how they go about it is entirely up to them. Moving on to **Engagement**, we encourage social interaction by allowing players to share genres with their friends within the platform, as well as list their own favourites for others to see. By doing this, players can discover and learn with each other, which should significantly shift the course of the experience. Finally, we move to **Reflection**. We can easily address this, as the entire platform is designed to assist players in finding new genres of music and challenge themselves to learn more about the ones they already know.

Thus, we feel that our proposal adequately follows the recipe for meaningful gamification and should coact successfully with the users' internal motivation to explore the world of music.

2.6 Problem Statement

Ideally, with the amount and variety of music available today, any individual with an interest in music should be able to explore and discover new genres of music that appeal to them. In reality, commonly used platforms for music listening unintentionally limit users via the Filter Bubble phenomenon, while using current genealogy maps instead can overwhelm them with choices. Consequently, this means that these individuals stay stagnant in music taste and knowledge. This not only limits their potential experiences with music, but it also represses new styles and artists from becoming known.

So how can this problem be overcome? Could a guided gamified experience promote open musical exploration and lead to remarkable discoveries?

With our main hurdles in sight, we propose to develop a structured gamified interface to guide users through a genealogy map to promote engagement in musical exploration.

2.7 Aims of the Study

We aim to achieve three main goals. The first is to **guide music discovery**, procedurally leading users to novel and memorable musical content. The next is to **promote music discovery**, fostering the users' desire to seek out new music and deepen their understanding of it. And the last is to **diversify music discovery**, leading users outside of their personal bubbles into strange new musical places. Places which they might heartily return to or completely reject but never forget.

With these goals in mind we have designed the following operational objectives:

- Design a gamified prototype structured around exploring music genres

  Select content to display

  Structure content map with meaningful gamification

  Implement a complete experience

- Test the prototype

  Define what would be relevant data

  Design the test around that data

  Gather participants

  Retrieve and analyze data

Chapter 3

Methods

This chapter delves into our process of *conceptualizing* and *developing* a prototype web-application meant to elicit a musical experience through gamified elements and mechanics, detailed on the previous chapter. We will be going over timeframes, decision-making and procedures that led to the interface used in this study, as well as additional dissemination means designed to reach potential participants.

After that, there is a section dedicated to the *evaluation* of the study, going over how the process of collecting data from participants was conducted and how that same data was processed and organized.

3.1 Concept

To test the effectiveness of gamification elements on the matter of musical genre exploration, we have devised a gamified interface called Soundventure.

Soundventure was built as a follow-up to an identically titled demo project developed alongside fellow colleagues André Sousa and Guilherme Lima. Screenshots of that iteration can be seen on Appendix C. This version was created in PHP, HTML and CSS, and used a SQLite database to store and retrieve information. On this iteration, users could login, choose a supergenre, choose a subgenre within that supergenre and then read information about it. They were also able to check their progress in each supergenre and see a list of locked and unlocked subgenres. Extra planned features included setting favorites for quick access and awarding achievements for different actions.

The functionality of this build was limited, as it was just meant to be a proof of concept. It proved to be a crucial step in increasing familiarity with the technology and even pinpointed a few concept issues that needed to be reworked. One of these was the terminology used when referring to "subgenres" and "supergenres". These got mixed up very often which greatly hindered discourse on these ideas. So these terms were later replaced respectively with "genres" - describing a particular type of music - and "category" - an umbrella that spanned over multiple genres. Another issue was the absence of a genealogy map, which could have drawn influences between

genres and better represent user progress. Since genres were to be unlocked through influences, having a map that tracked all of them was a critical first step to accomplish when designing a new version. The remaining issues had to do with deficiencies made clear by new information found in the state-of-the-art phase of this study, like the elements of intrinsic motivation often used in gamification and social engagement features.

Based on the work done with that team, the creation of this new version of Soundventure brought the design back to the drawing board. New wireframes were made in Figma, which included a few prototyping features. That way, we could preview how navigation would work and determine how to successfully improve UI design. Two sets of wireframes were developed - a desktop and a mobile version - in the event that both could be realized. By doing so, the platform would be more accessible to all potential users.

Figure 3.1 shows a blueprint flowchart of how each page would later interact with each other in this new concept.

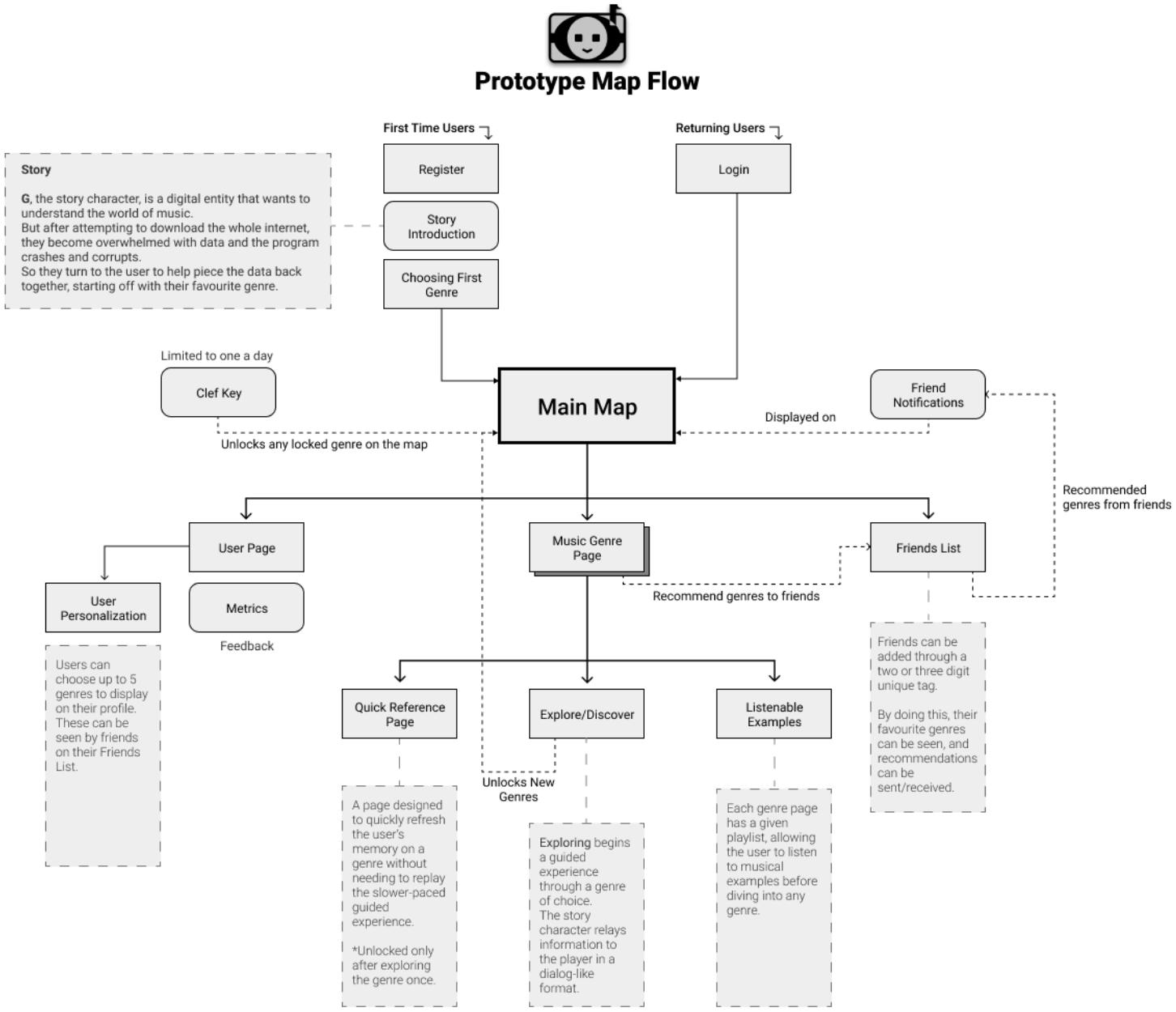


Figure 3.1: Soundventure's Early Concept Flowchart

3.1.1 Characters and Narrative - Presenting 'G'

One of the first steps taken with this new design was Soundventure's assistant character *G*. Its name is short for GENREBOT, but it is also a reference to the identically-labeled musical note. This character would serve as a vehicle for the underlying narrative of the platform, which is "to help G assemble a map of every genre on the internet". G is designed to resemble an Artificial Intelligence (AI) or a robotic lifeform that specializes in music. The implied backstory is that its a newborn entity that is not yet aware of how diverse music currently is, maybe even less than the player. But by joining together, they would eventually learn everything.

As an enthusiastic AI that specializes in music, G's design had to reflect both of those aspects. G was made to look very square-like to resemble a robotic monitor. At the same time, its face and antenna put together resemble an eight note (♪). G can be seen on figure 3.2

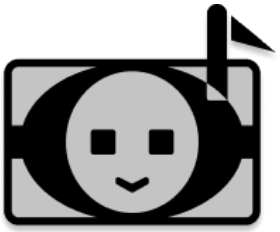
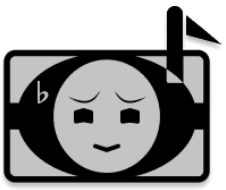
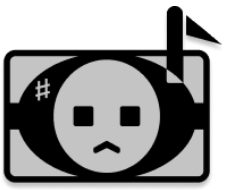


Figure 3.2: G - Soundventure's Assistant Character

When embarrassed, G displays a flat (♭) on the left. This is was chosen for two reasons. First, the resulting expression resembles the sweat drop trope often used to show embarrassment or disappointment (TV Tropes. a). Second, when a flat symbol precedes a musical note, its pitch is lowered by half a step - mirroring situations where G is figuratively taken down a notch. On the flip side, when G is upset, it displays a sharp (♯) on the left. This time, it is made to resemble the cross-popping veins trope (TV Tropes. b). Like before, it is meant to show that G is raising the intensity, like how a sharp raises notes a half-step in pitch.



(a) G - Embarrassed



(b) G - Upset

Figure 3.3: G - Flat and Sharp Expressions

Keeping up with that theme, when G is surprised or shocked, its antenna raises up making G resemble a half note (♩).

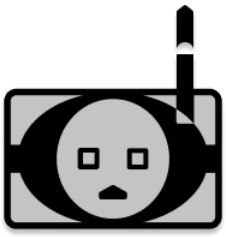


Figure 3.4: G - Shocked

3.1.2 Story Premise

The premise and platform introduction sequence were drafted at an early stage. G had to be given some dialog in order to cement its personality as well as the overall tone of the platform. For that reason, a few storyboards were made defining how that sequence of events would play out.

After logging in and filling out the entry form, users would meet G for the first time. On this prologue, G introduces itself and asks the user to select a genre they are familiar with. This aimed to achieve three things:

- Introduce an opportunity to interact with G in the introduction, keeping it from being solely text-based and strengthening G's presence as a dynamic character,
- Directly challenge the user to reflect on what they know about music,
- Covertly soften the platform's first choice. Whichever genre the user chose would be their entry point on the map.

After choosing a genre, G gets overly excited and begins asking several questions: *"What do you like about it? When did it emerge? Who were the pivotal figures? What does it share in common with <another genre connected by influence link>?"*. This was meant to provoke a defensive reaction on the user and help them realize that they might not know as much as they thought they did about something that they really like. G admits that it is being too forward and suggest that they should try learning this information together. Slightly relieved and with their curiosity piqued, the user should then be in the right set of mind to explore their first genre.

After listening to G describe their genre of choice, the introduction resumed. By then, users had had a little preview of what the platform was about, so this would be a good time to convey the premise. G remarks that it would be great to find more information about every existing genre, just like they did just then. It points to the internet as a great source of content and dares itself to download all of that information at once into a cohesive map. However, that effort fails as it proves to be a feat too overwhelming. This directly mirrors this study's problem statement, placing G in the position of the average inquisitive listener. So G brings up the idea of piecing the map back together, genre by genre, starting from the one they have already explored. The user's journey with the platform was now set from here on out - bring the map back together by learning more about music, one genre at a time.

3.1.3 Pages

Moving on to the new website interface, six pages were devised for interaction:

- A *Login/Register* page (figure 3.5) where the user is informed of relevant information before participating in the study. Registration was an imperative part of the platform, as it was needed to save user progress and to keep track of each participant's interaction.

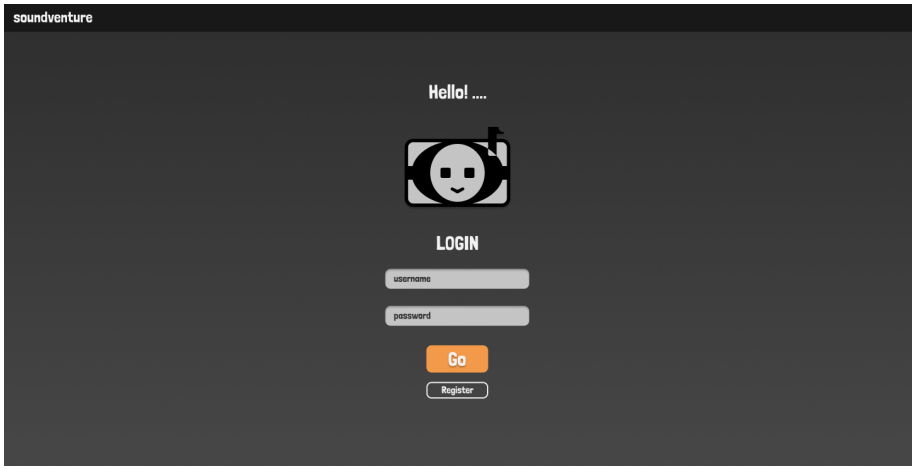


Figure 3.5: Wireframes - Login/Register

- A *Map page* (figure 3.6) showing every completed, available and locked genre as well as lines between every genre for each of their influences. This would be Soundventure's main page where users can access most other pages. This page closely resembles *musicmap*'s so that comparisons could be facilitated between both platforms.



Figure 3.6: Wireframes - Map

- A *Genre Select page*, for each genre, where a user can quickly tell each influence connected to that genre (figure 3.7). Genres on the same category are represented on the center, while

genres from other categories are shown on the right. On the left there is a menu with a short description of the selected genre showing its era and category, buttons that proceed to the Explore page and Quick Reference page, a button to recommend that genre to friends and another to play an audio example of that genre. This is the page someone would use when wanting to interact with a specific genre.

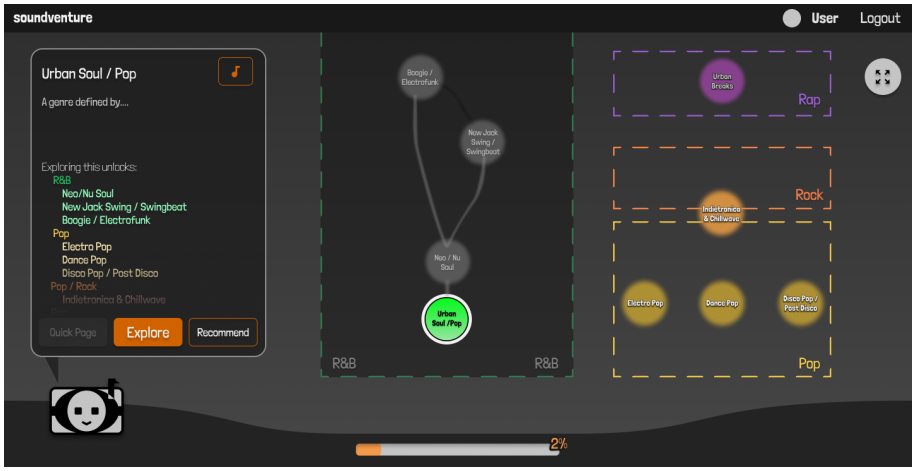


Figure 3.7: Wireframes - Genre Select

- An *Explore page*, for each genre, where users learn what the selected genre is about (figure 3.8). This information is presented through a dialog system, with G relaying it sentence by sentence. By doing it this way, users could pace their reading without feeling overwhelmed by the amount of text. This page has a lot of empty space so that it could be filled later on with images or other types of media that could be useful in assisting G's dialog. Additionally, it would also play music excerpts and other sound effects too. By reaching the end of a dialog, the user would unlock other genres linked to the selected one through their influences, meaning that they could now access them.

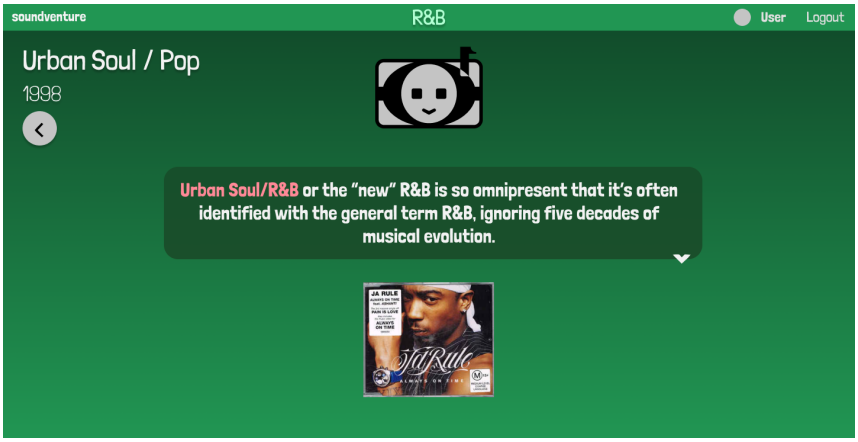


Figure 3.8: Wireframes - Explore

- A *Profile/Stats page*, for each user, where they could customize a few options like their profile picture and favorite genres (figure 3.9). They would also be able to check a few statistics showing how they have been doing on the platform.

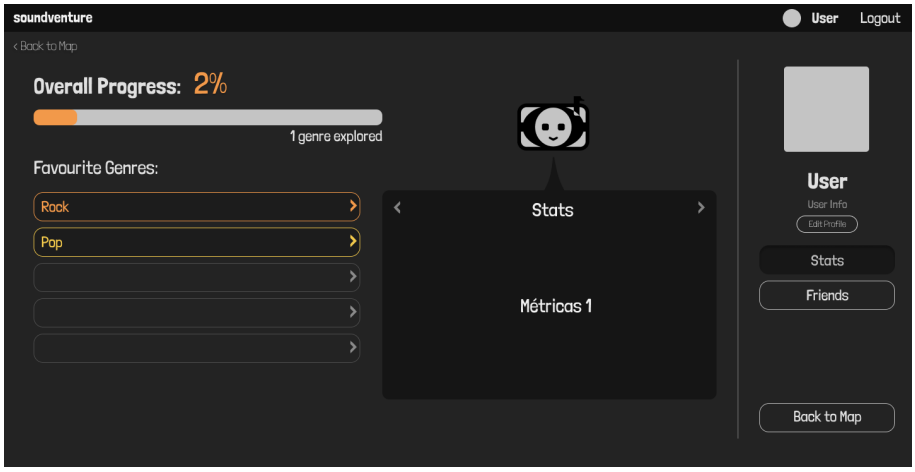


Figure 3.9: Wireframes - Profile/Stats

- A *Friend page*, for each user, to manage their friends and recommendations (figure 3.10). They would be able to send recommendations to their friends, see what genres each friend has on their favorites and what recommendations they made to the user.

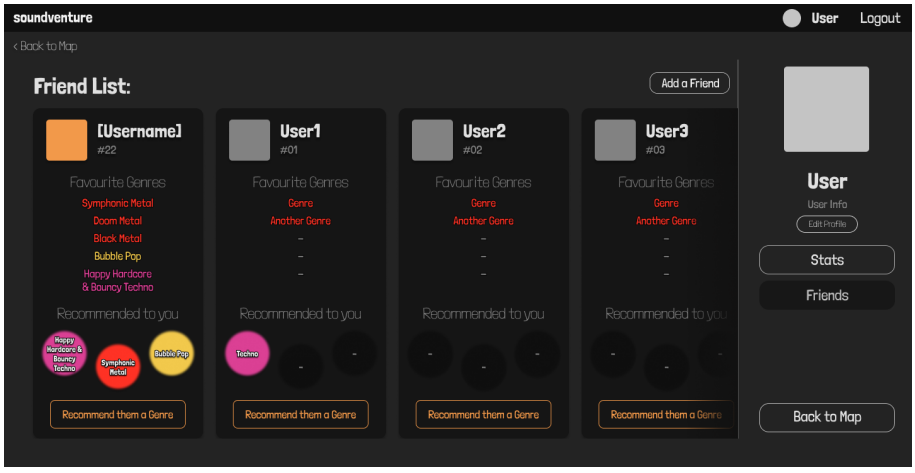


Figure 3.10: Wireframes - Friends

One other page, named the "Quick Reference" page, was conceptualized but not developed upon. This would have been a place to quickly refresh the user on the contents of a select genre of music. It could only be accessed after completing said genre. With this, the user could simply read the bullet points instead of going through the dialog in the explore page again.

A variation of the Explore page was planned as an introduction to G and the Soundventure platform, setting the scene for the experience (figure 3.11).

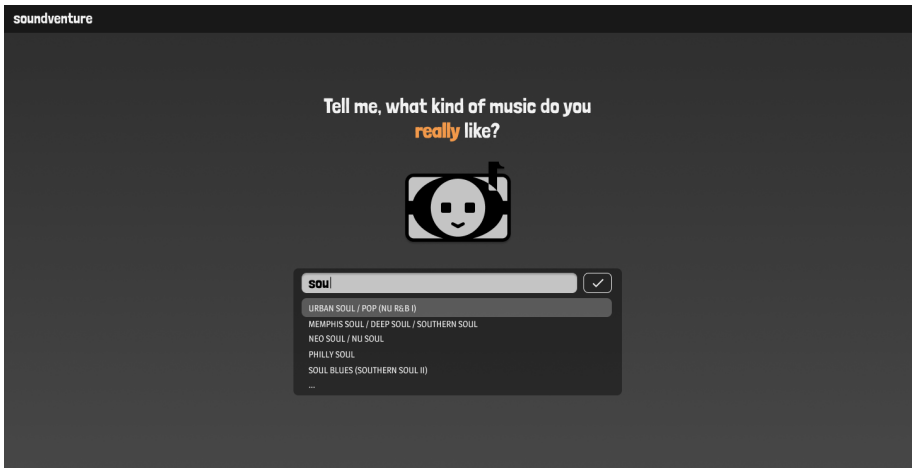


Figure 3.11: Wireframes - Intro (Explore Page Variation)

Besides pages, other smaller prompts and menus were designed, like friend notifications, footers and dropdowns.

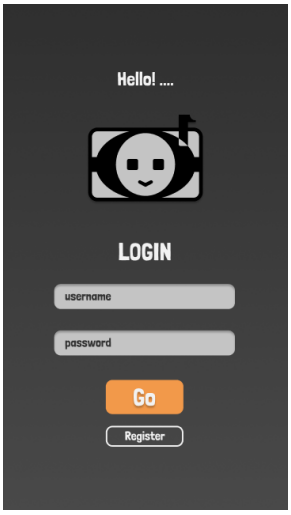
Lastly, the mobile versions of these pages were largely similar to their desktop counterparts, only adapted to smaller screens and touch controls. These can be seen on figure 3.12.

3.1.4 Items - the "Clef Key"

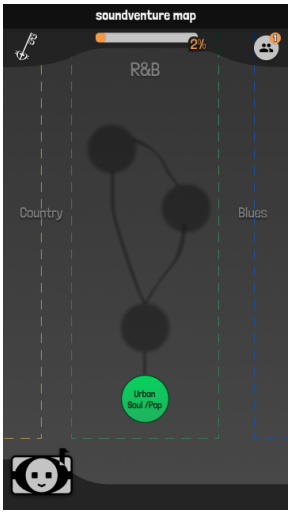
Lastly, we designed an item named the Clef Key - seen on figure 3.13 - which gave users the power to unlock any genre on the map once a day. This item is modelled after two clefs used in music notation, the F-Clef (𝄢) and the C-clef (𝄡).

The name and concept of the "Clef Key" was born from a play on words, since "Clef" is the French word for "Key". This makes our item the "Key key", basically.

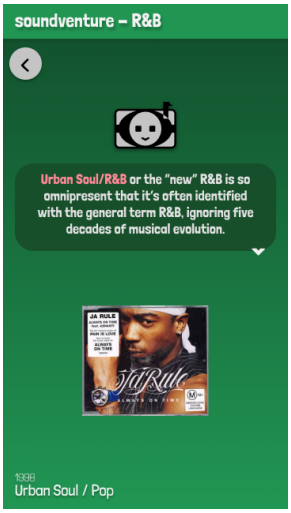
With this blueprint set, development of the platform began.



(a) Mobile Login



(b) Mobile Map



(c) Mobile Explore



(d) Mobile Intro

Figure 3.12: Wireframes - Mobile Versions



Figure 3.13: Clef Key

3.2 Development

The development stage began with an analysis of possible ways to assemble a draggable map page that could be zoomed in and out. The most adequate solution we found was a Javascript library named "vanilla-js-wheel-zoom". It seemed to be compatible with assets created for the previous version of Soundventure, which greatly cut down on development time. It was not perfect, however. This library was designed to resize images within containers and did not have many customization options available. But it did provide the ability to place and resize elements (badges) along with the image, which was greatly exploited. By tweaking some of its code, we enhanced this library to support multiple badges and added the ability to rescale text. By doing so, we could now place several nodes for each music genre on the map, just like it was planned on the wireframes.

Moving on to basic UI elements, the website header was brought back from the previous iteration, with slight graphical modifications. An entirely new bottom bar element was created, displaying G, a progress bar tracking how much of the map was complete, and a Clef Key availability indicator. These were all SVG elements, aside from the progress bar which also carried over from that past version.

In order for the website to store data and generate context-sensitive information it needed to connect to a database. Throughout this development, many PHP functions were created to prompt the SQLite database to store, retrieve and display all sorts of information. The creation of one or many such functions is implicit in every process that relies on information from the database and will not be mentioned further from here on out.

3.2.1 Map Page

The first step was to have genres appear on the map by generating them through database entries. To do so, a table was created to store every genre of music that the platform had to display. This table needed a column for the genre title, another for their category (*supergenre*), one more for a unique identifying code (*code*) and two for each coordinate (*positionx*, *positiony*). The category column determined what color the genre badge would have when generated. Each possible category was color coded, so if two genres shared the same category, they would share the same color as well. The *positionx* and *positiony* column determined where this genre node would be positioned. To generate these genres, the website cycled through every entry on the genre table and created a badge in its proper place. Once that was working, we tested a few display variations to represent "complete", "available" and "locked" genres.

The next step was creating visual connections between badges, also generated from the database. A new table was added called "genrelink" with two columns identifying the desired genres that should be linked. From there, the website could draw an SVG line by using two points with the same coordinates as the stated genres. Like the other map elements, these lines also needed to scale correctly when zooming in and out, so we made sure to alter the javascript library again to make that possible.

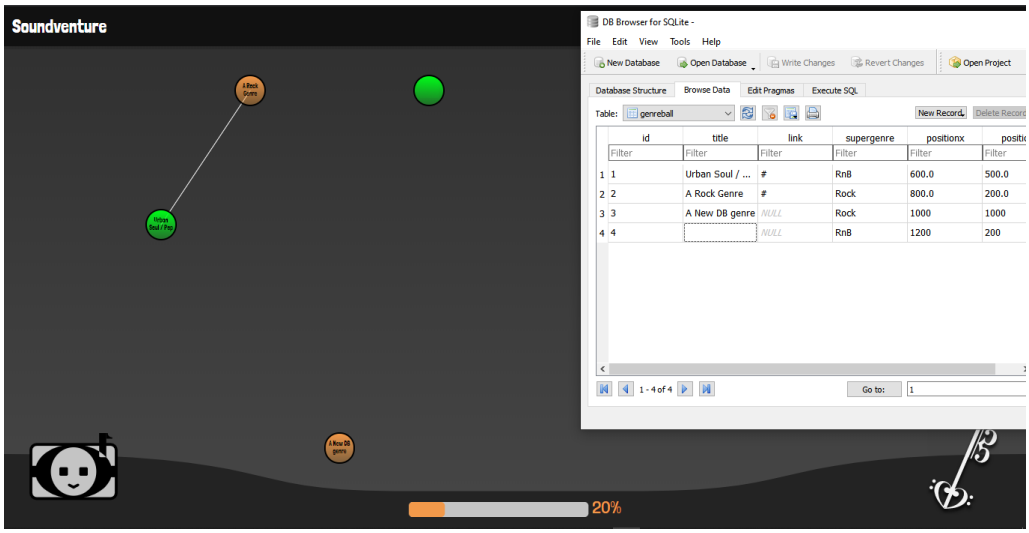


Figure 3.14: Development - Badges and Connections

With the fundamental map building blocks in place, there needed to be musical information to populate the database. We sourced that from *musicmap* using a python script running the Beautiful Soup library. This allowed us to parse through their website's source code and retrieve data like genre titles, coordinates, and primary connections and store these directly into the database. Other connections were left out, like secondary origins and anti-influences, in order to have a simpler map and keep users from unlocking too many genres at once when completing any one of them. Just like that, we managed to recreate a lighter version of *musicmap*'s genealogical map within Soundventure.

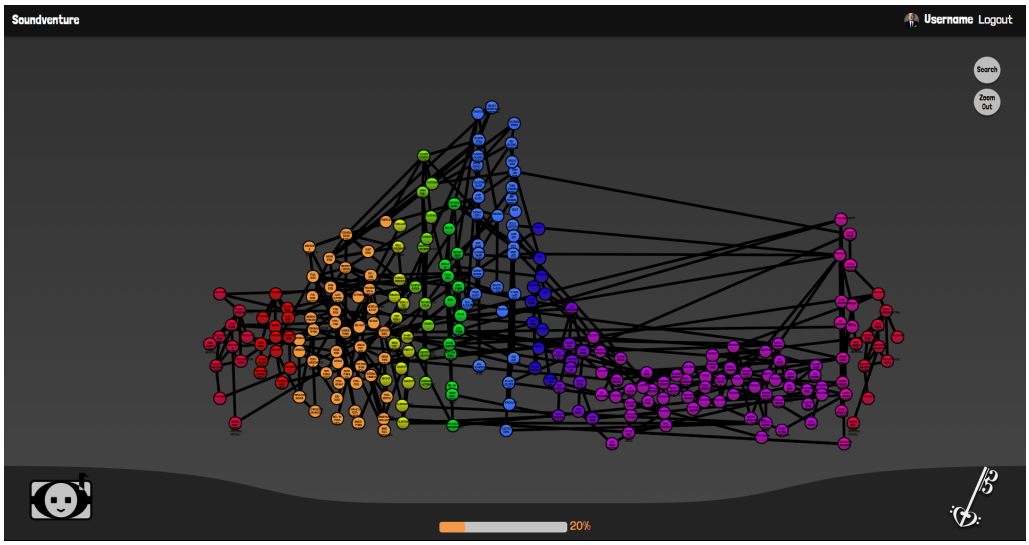


Figure 3.15: Development - Early Map page

3.2.2 Explore Pages

With the map in place, it was time to develop the second crucial system: Dialog. Using Javascript, a method was put together that would receive a line of dialog, to then output it letter by letter in a typewriter-like effect. Then, we made it possible to proceed from one line of dialog to the next by placing them in an array of objects. Each object would correspond to a line, and each array of objects would be a story. Several subsequent enhancements were made to this system, like having multiple choices jump to different parts of dialog (which ultimately was not used), a fast text mechanic (which made text type itself faster if the user pressed the button again, while at the same time preventing the user to skip this line until it was fully typed out), and text customization options to aid in developing these stories. These options can be seen on table 3.1.

Table 3.1: Development - Dialog Options

Dialog Options	
Message Types	
m	normal message to be typed onscreen
u	message that could not be rushed (unskipabble)
f	message that prevents proceeding to the next (final)
uf	both 'u' and 'f' types together (unskippable final)
Sequence Options	
seq	delay in ms before typing the following message on the same dialog box (used for creating a paused *sequence* of lines)
a	delay in ms after which the line automatically skips to the next one without needing player input (autoskip)
Message Modifiers	
size	changes the current message's font size to this variable's value
weight	changes the current message's font weight to this variable's value
color	changes the current message's color to its value
speed	changes how fast the message is typed on screen
Other Options	
function	execute a function with the same name as this string (if it is an empty string, execute the function designed to complete a genre)
code	identify which genre the current array corresponds to (placed on the first line of each genre story, with the same value as that genre's unique code)

Combining the newly functional dialog box with an SVG of G, we now had a way of having our expository character interact with the user, paving the way for the Explore Pages and the introductory sequence.

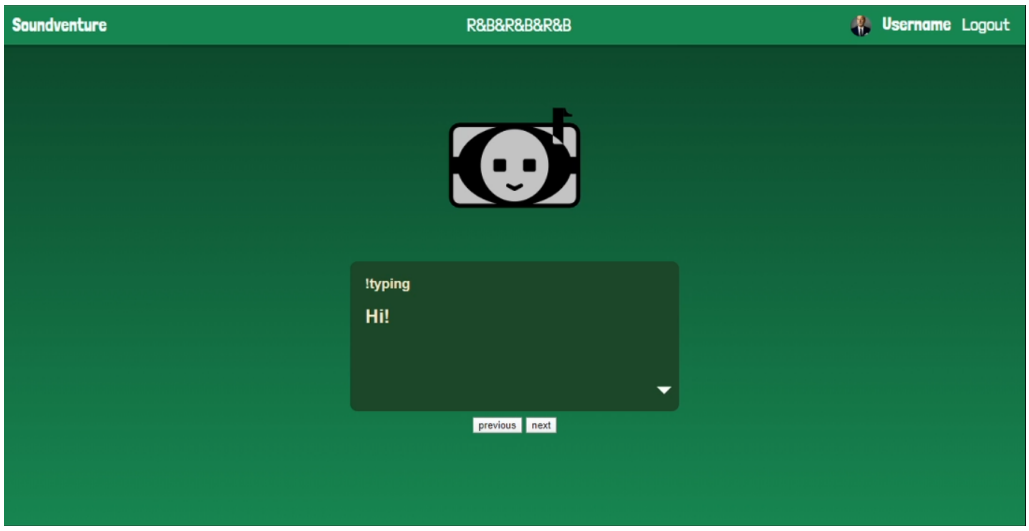


Figure 3.16: Development - Testing Dialog

The explore pages needed to be able to convey a deep understanding of each genre to the user. The website needed 234 stories for G to narrate, which meant each of these needed an array with several lines of dialog. To create all of these would require a very different type of project with a much larger time-frame and more resources. So we turned to *musicmap* again, since their structure was inherently compatible with our prototype.

Even then, transcribing 234 descriptions for every genre manually and carefully breaking them down into lines of dialog would still take a considerable amount of time. So instead, we automated that process with a Python Script once more. This time around, descriptions were not simply available on their website's source code. It had a slot for genre descriptions to be generated, which swapped out for whatever genre was selected at the time. Thus making it ineffective to use Beautiful Soup by itself, since there would still be a need to click every genre manually so that the script could retrieve that information. To cut down on this idle time, we used another Python library called Selenium, which made it possible to automate page interactions. This meant that this new Python script could sequence several page clicks, spawning the descriptions, and alternate with Beautiful Soup to fetch this text. It still took a few minutes, but this process could now run in the background without taking any more development time. Before storing this information, this script would split these texts at each full stop to create dialog lines. Then it would format these lines into objects with "m" labels, with each description lines being placed in separate arrays. On the first line of each array, it would place the unique genre code in a *"code"*-labelled object so that this story could be retrieved at the proper time. At the last line, the script would place a *"function"*-labelled object with an empty string to signal the end of this genre story, triggering the *"complete genre"* function which would later register the user that completed it and unlock all the connected genres for them as well. An example of these stories can be seen on figure 3.17.

Besides the descriptions, there were other bits of information present on these pages that could be useful to save for later use. Titles were slightly different, since they could now take more

```
// ACID HOUSE
[
    {code:"hou02", m:"Originally, Acid House was strongly tied with other Classic House."},
    {m:"In fact it was not much more than Chicago or Garage House with the added distorted sound of \
    the infamous TB-303 bass synthesizer."},
    {m:"These early, isolated examples of Acid House were known as “Jack Tracks”, which was also the name for the first and most\
    famous Acid House record label (Jack Trax)."},
    {m:"By looping a certain note and then distorting the resulting wave (by cutoff, resonance or envelop), \
    the characteristic and psychedelic “acid sound” was created, which could be used for basslines, melodies, or synth stabs."},
    {m:"The term acid is derived from the very first Acid House record: Acid Tracks."},
    {m:"This sound became so popular in the entire world of Dance music, that Acid House soon was a well-established genre on its own."},
    {m:"In 1987 the first (affordable) electronic samplers arise, which become heavily used in the world of Rap and (Acid) House."},
    {m:"Acid House starts to incorporate Rap elements (Proto Hip House) and becomes a hyperactive and epileptic bricolage of samples."},
    {m:"This moment is the start of the Rave culture, which skyrocketed after the Second Summer of Love in Ibiza (also in 1987)\
     and became immortalized by the yellow smiley symbol."},
    {m:"But the paramount trademark of Acid House is a severance with House’s Disco influences and the corresponding gay and hipster \
        subcultures."},
    {m:"In Acid House, there is no longer a warm groove, no R&B feel, but harsh and distorted sounds onto a\
     loud four-to-the-floor beat. "},
    {m:"All of the sudden, House becomes something even white British Post-Punk artists can relate to, being rough and revolutionary."},
    {m:"Though these evolutions were incidental, the consequences were unimaginable."},
    { function:""}
],
```

Figure 3.17: Development - Story Object example

space. Each genre had an exact date of origin and two category tags that further detailed their classification. At the end, there were two playlists available - one on Youtube and another on Spotify. We made changes to the genre table in order to hold this information, and made sure to add the ability to retrieve it using the Selenium script.

3.2.3 Login

Two main pillars had been achieved on the website at this point in development. The **map**, which served as the main method of overviewing and choosing content and the **dialog system** that conveyed each instance of this content in an interactive playful format. Now there was need for the website to keep track and react to accordingly to each user’s progress. We modified a PHP Login form with built-in SQLite support obtained from the *php-login project* in order to adapt to Soundventure’s visual style and requirements. A new table of users was added to match this system, which saved a user ID, username, password and email. User ID was a unique number used to identify a user. It automatically incremented when a new user was added. Username and email were also unique values, meaning that different users could not share the same name or email. Passwords were immediately hashed by the PHP login script, which added a layer of security and kept them private to each user. Registering emails proved to be useful to contact participants on the second round of questioning, but since no validation system was put in place, not every participant left a viable address.

With users being able to register and login with proper protocols in place, pages needed a way to tell which user was currently in session and display information that reflected that. A new "completed" table was added to the database that kept track of which user completed which genre. This table affected the progress bar and changed how genres appeared on the map (complete, available or locked), which, in turn, defined what genres the user had access to at any given point.

To identify which user was accessing a page, the website could simply use the session variable "username" created when logging in on the platform.

3.2.4 Genre Select Pages

The last thing needed for the prototype to be playable was a page to transition from the Map to each Explore page. Each genre had its own Genre Select page, where they took center stage. To match the wireframes, related genres had to be split based on category. The website ran a similar method for both the center division and the right-side division: First it gathered every connected genre. Then, it ran through each one to place them and define their 'available state', just like it did on the map. This time around, it checked if the category matched with the selected genre or not. On the center division, it placed genres only when they matched, while on the right-side division, the opposite thing happened. The center division method also checked whether a genre was older or more recent than the selected genre, and placed them above it as a predecessor or below it as a successor respectively. On the left side, there was a panel with the genre title, year of origin, and category types as well as a button to access the selected genre's explore page. We also embedded a Spotify Playlist on it by slightly modifying the links retrieved during the Selenium process and turning them into Spotify URIs.

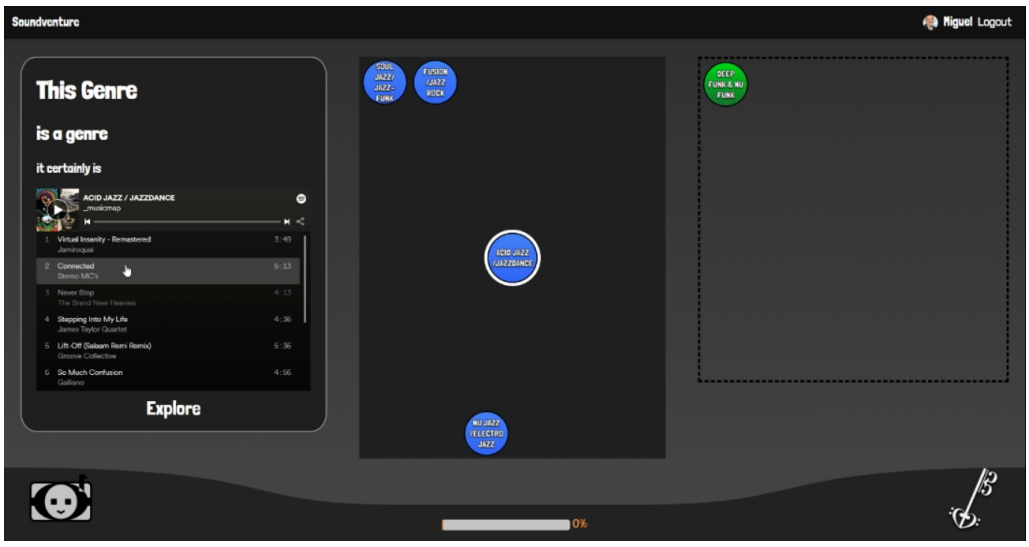


Figure 3.18: Development - Early Select Page

Now that both the explore page and genre select page templates were in place, they had to change according to the chosen genre. This was accomplished by placing a variable in the URL appropriately called "genre", which held the corresponding genre ID number. This variable would then be fed to every function meant to retrieve information, from story content to related genres. Links on every button would change accordingly to redirect users to the proper addresses. For instance, if the genre selected were to be *genre 32*, then the Explore button would redirect to the

Explore Page assigning a value of 32 to the url "genre" variable. In turn, this would retrieve the story content for *genre 32*.

With this, the website was properly explorable and could be used to play around with. But it was a far cry from the planned experience and a lot of work had to be done still. Especially since it could not even be used for data retrieval yet.

3.2.5 Data Collection

A prototype meant to be studied would not be of much use if it could not register data. To maintain a proper archive, we created a log table on the database. Each entry would state what action was performed by a select user at that point in time. We will be showing the final codes used for log entries later on this document (table 3.5).

These logs were also an important key to prevent users from sequence-breaking. Using them, we created a script that redirected users back to the intended path whenever they attempted to access a page that they should not be able to. For instance, if a user tried to access the map without first having answered the entry form, they would be redirected to that form page regardless. If they had submitted the entry form but had not finished the introduction yet, the website redirected them to the intro page and played the appropriate dialog lines. Figure 3.19 shows a flowchart indicating the logic behind every redirection.

Methods to record data for each participant were now in place and Soundventure could be studied regardless of its final state. But since this experience strived to be as engaging as possible, we continued to improve upon it.

3.2.6 Clef Key

On the bottom of the map page there was an icon that represented the Clef Key. If that icon was filled in, that meant the user could unlock any genre on the map. If they did so, they could only access it again after 24 hours. To achieve this mechanic, the website created an entry in the log table with the string code "clef" whenever a user chose to unlock something with the key. This registered the time at which this action was performed, as well as the genre it was used on. A new condition had to be made to determine whether a genre should appear available on the map - "is there a Clef Key entry on the log table, made by this user, that unlocks this genre?". At the same time, this entry had a timestamp which could now be used to ascertain if 24 hours had elapsed since. If that time difference was not fulfilled, then the Clef Key became unusable. When the Clef Key was unavailable, its icon grayed out on the bottom bar displaying a countdown over it. This would tell the user how much time remained until the key could be used again. The countdown's value was also determined by the time difference mentioned before.

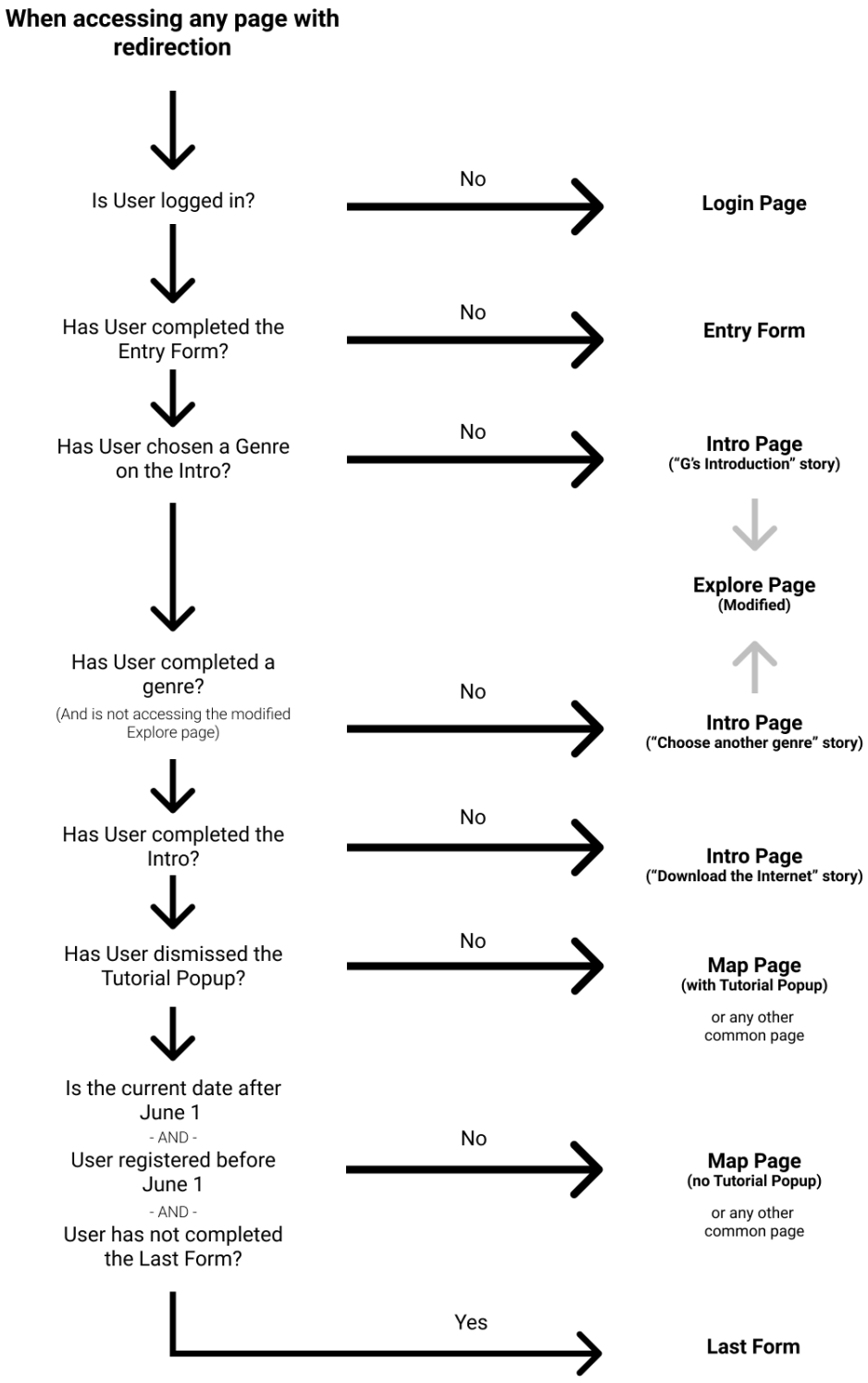


Figure 3.19: Development - Redirection Flowchart

3.2.7 Narrative Sequencing

Users were prevented from sequence-breaking, which naturally implies that there should be a sequence to keep.

An introductory dialog scene was made, where G presents itself and Soundventure. This scene used a modified version of the Explore Page template, since they both had a similar purpose. In this sequence, the user would choose a genre they are most familiar with without being told explicitly how that affected their experience. G enthusiastically looks the genre up on the internet (fictitiously), sending the user to the respective explore page. This first explore page had to be slightly different, since it could not really bring the user back to the map or the genre select page from here. Instead, it offered the choice to go back and ask G for a different starting genre, if they so wished. If they proceeded to the end of G's dialog, that genre would be marked as complete within the website and the user was then redirected to the intro page again. Since they had completed a genre now, the dialog would be different this time around.

This new stage of the intro sequence provided the main premise of the platform. G attempts to download all of the information about musical genres that the internet has to offer, but fails when attempting to parse through all of it. G even states that some pieces of the map may be missing, meaning that no matter how much information is gathered on Soundventure, it will never be a complete representation of the available content on the internet, only an approximation.

To convey this information at a more emotional level, a few improvements had to be made to the dialog system. Namely in terms of animations and expressions for G.

To have these expressions, several SVG files were created for each one and assembled together in an HTML file. Then, their visibility was toggled as needed, displaying only one of them at a time. A switch case was put in place that responded to specific strings to determine which expression to toggle in. That list of string codes is shown on table 3.2.

This variable was then incorporated into the dialog system, under the name *GExpress*. If a line of dialog had no *GExpress* variable, G kept its previously assigned expression. If that variable existed and was an empty string, G's expression would default back to neutral.

Animations were created by using both Greensock's Animation Platform (GSAP) and Anime.js, an open source javascript library. Both were used for very similar purposes, only GSAP was used first. When it came around to switch to Anime.js, a few GSAP animations were kept as they were.

One of these first remaining animations was G's idle animation, where it slowly floated up and down at all times. This helped G look less static and uncanny.

Programmable animations were added into the dialog system as well, represented in table 3.3.

Content division elements (<*div*>) and images could now be animated as well using object variables "AnimDiv" and "AnimImg" which was used to bring in the list of genres on the introduction and could have paved the way to add images to an explore page.

Table 3.2: Development - Expression Codes

Expression Codes		
MO	Mouth Open	
SHO	Shocked	
EMB	Embarrassed	
RGRT	Regretful	
LRS	Look Right Smile	
LRN	Look Right Neutral	
LLS	Look Left Smile	
LLN	Look Left Neutral	
HS	Happy Smile	
HO	Happy Open	
EDS	Eyes Down Sigh	
EDOM	Eyes Down Open Mouth	
EDN	Eyes Down Neutral	
EDF	Eyes Down Focused	
EXC	Excited	
ASAD	Angry Sad	
ASML	Angry Smile	
AN	Angry Neutral	
(default)	Normal Smile	

Table 3.3: Development - Animation Options

G's Animation Options - ("animG" object)	
loop	Repeat the animation steps that succeed this variable
speed	Determines speed of the succeeding animation steps
move:"By"	If move variable is a "By" string, then move G by the specified x and y values
move:"To"	If move variable is a "To" string, then move G to the page position specified by the x and y variables

Image and Animation Options - ("animPic" and "animDiv" objects)	
loop	Repeat the animation steps that succeed this variable
speed	Determines speed of the succeeding animation steps
move:"By"	If move variable is a "By" string, then move image or by the specified x and y values or by viewport percentage through variables xPerc and yPerc
move:"To"	If move variable is a "To" string, then move image or to the page position specified by the x and y variables or the viewport percentage specified by variables xPerc and yPerc
fade:"In"	Similar to move. Fades in image from its initial position (optionally overrided by x1, y1 or x1Perc and y1Perc) to another position (specified by x2, y2 or x2Perc and y2Perc)
fade:"Out"	Similar to move. Fades out image from its current position (optionally overrided by x1, y1 or x1Perc and y1Perc) to another position (specified by x2, y2 or x2Perc and y2Perc)

The last animation needed was the "downloading the internet" section. That was created through an Anime.js function coded into the intro page triggered by a "function" variable in a line of dialog.

3.2.8 Additional Features

The platform is now functional, ready to be studied and has some added visual flair to enhance user experience. At this point there was still some development time available and we were torn between two options to add in: Enhanced Stories or Social Features.

Each genre had a story being shown on their explore page and this was already a nice accomplishment. But they could still be expanded upon by adding images to the animation system of anything that were to be mentioned, like bands and regions, as well as sounds and audio excerpts to further delve into the genre's intramusical characteristics. The plan was to design 11 stories for one genre in each category, as examples of what could be done in this platform. Having stories for each 234 genres would have been optimal, but that would have taken an entirely new development cycle to accomplish. We selected 11 genres and began researching info and collecting images to further develop these stories.

However, we ran into some problems. First, gathering images related to forms of popular music that were not subject to copyright protection was inherently troublesome. Second, the process of developing even a single story was more time intensive than expected. Third, we would need to restructure the prototype to ensure that participants would encounter these stories. Otherwise, it would have been very improbable for users to come across them, which would not be very useful when it comes to collecting data. To keep things simple, we decided against pursuing this option. As a side-note, one genre from this attempt to enhance stories remains altered in the final version. While it does not have any images or sounds added, Gothic & Symphonic Metal had its text changed to include some text pacing, as well as some animations and expressions for G to go along with it.

Instead, we began working on a second option - Social Features. A "Friend Menu" page was built, similar to the one seen on the wireframes. Each friend added by a participant had their own panel on this page. These panels were then laid out on a horizontally scrollable list, taking up a large area onscreen. Each panel displayed that friend's username and friend tag (which was just the user ID formatted in 4 digits with a "#" symbol preceding it), their favorites (up to 5 genres) and recommendations (up to 3 genres) made to the current user. The user can then make their own recommendations to that friend by clicking the "Recommend Something" button. On the right side, the active user can see their own username and friend tag, as well as favorites which they can then set out of the genres they have completed so far.

A system was put in place that kept track of friendships between users. A user would be able to find another user by clicking the Add Friend button and submitting their friend tag. After both users went through this process, they would appear on each other's friend menu. This was accomplished by creating a new database table called "Friends", which stored these requests. If a user sent a friend request to another, and no request between them had been made yet, a request was created. The user who sent the request would be User1 and the receiver would be User2. The remaining "Status" column determined whether this request was pending(0) or accepted(1). If User2 submitted User1's tag, status would go from 0 to 1, and both users were now considered

Friends within the system. At this time, no notification system was in place, so both users had to know and submit each other's tags.

Besides the friend table, a "recommendation" table was also created. This one stored what genres (genre1, genre2, genre3) each user (UserBy) had recommended to another (UserTo). These are represented on table 3.4.

Table 3.4: Development - Friends and Recommendations tables

Friends Table			
user1	user2	status	
1	2	0	Pending friend request sent by User 1 to User 2
4	3	1	Friend request sent by User 4 accepted by User 3

Recommendations Table				
userBy	userTo	genre1	genre2	genre3
1	2	14	NULL	16
User 1 recommended genres 14 and 16 to User 2 (Second recommendation slot was left empty)				

With these features ready, the overall structure was complete. The only thing left was to place the website online.

3.2.9 Hosting the website

It was necessary to determine if the website could be made accessible to anyone online, otherwise it would end up being a very short-lived experiment. A solution was found in Gearhost, which is a cloud hosting service. They had support for PHP and SQLite and had a free plan which was useful for setting up a test.

Soundventure was now uploaded to the web and could be accessed through the url: `soundventure.gearhostpreview.com`. Not the easiest one to remember, but it would do for now.

With this, Soundventure was ready for its first test.

3.2.10 Pre-launch

Two weeks prior to the general study, Soundventure was shared with a few peers. This served as a trial period to observe participant behavior, receive feedback and detect any problems that might need fixing.

Notes were taken of 3 participants in particular who added each other as friends on the platform. Each went through the same process as the future participants would: they had to complete

the entry form after registering, could freely use the website for a two week gap before having to fill out the final form. Throughout these two weeks we made as many changes as possible based on their comments, in order to craft a better experience.

Listed below are a few of the main issues that came up and how we went about to fix them:

- The website was too slow between pages due to Gearhost's servers. This meant that users began to click impatiently on links and buttons, since the website gave no indication that it complied to their input. To solve this, a loading screen was added that popped up on the top layer whenever a user navigated to another page.

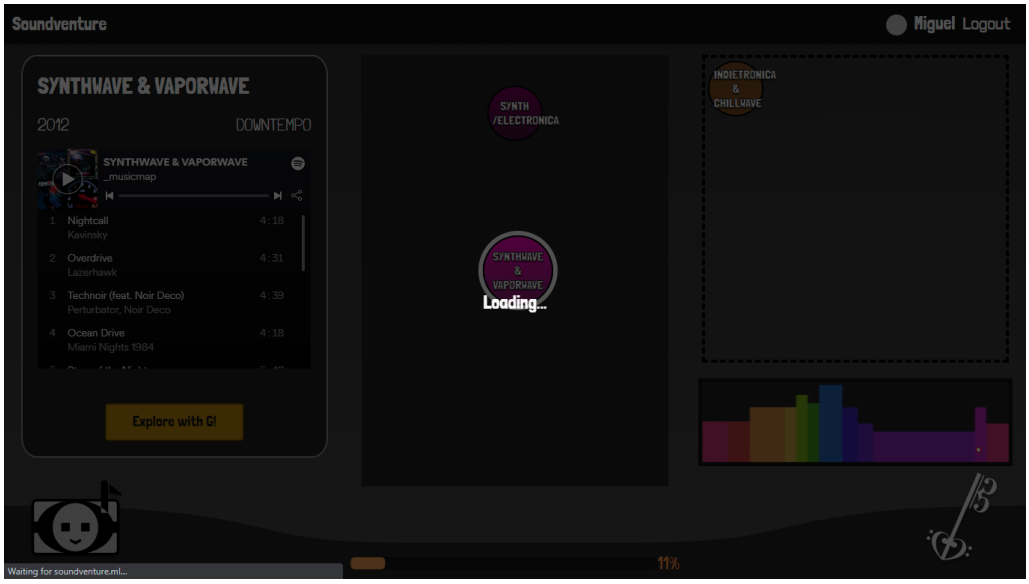


Figure 3.20: Final Changes - Loading Screen

- Using the 'Enter' key to proceed through lines of dialog was unintuitive. So the input was changed to respond to either the spacebar or a click anywhere onscreen.

- It was not obvious that a person should press some kind of input when the first dialog came up. A new line (seen on figure 3.21) was added before G presents itself asking the user to press the spacebar or click the screen to confirm they can read its dialogue.

- Users were drawn to the Clef Key image at the bottom and clicked it when they wanted to use it instead of clicking the locked genre they wanted to unlock. This was fixed by adding a popup with instructions on how to use the key in case it was pressed.

- Users could not find a way out of the genre select page to access the map again. So a functional minimap was added within this page shown on figure 3.22. When clicked it would return to the map, but it was also capable of showing the current genre's location on the map itself. This was useful as a reference when navigating from genre to genre.



Figure 3.21: Final Changes - Dialog Instructions



Figure 3.22: Final Changes - Select Page

- It was not clear which genres were available and which ones were complete just by looking at the map. At the time, available genres had the same color as completed genres, only slightly darkened. This was changed to a white color instead to add more visibility. This can be seen on figure 3.26.

- The explore button on the genre select page did not seem to lead to another page like it was intended. Users felt like it had to do with the playlist or that it just did not do anything. This button was filled in with an orange color and the text was changed from "Explore" to

"Explore with G!" to make it stand out more.

- The back button on the explore pages seemed like it played the previous line of dialog and not that it went back to the genre select page. The text on this button was changed to "back to the select page" to make that more clear.

- There was no way to go back to the previous line of dialog, so if the user missed anything they would have to replay the whole story again. This problem was a bit more complex, although very important to solve. The dialog system was altered to support a "previous line" function, and a clickable option was added on the bottom left of the explore page that executed that function. This option, seen on figure 3.23, only showed up on the page whenever it should be possible to go back to the previous line - meaning that it was disabled on the first line of every story and while a line was being typed out onscreen.

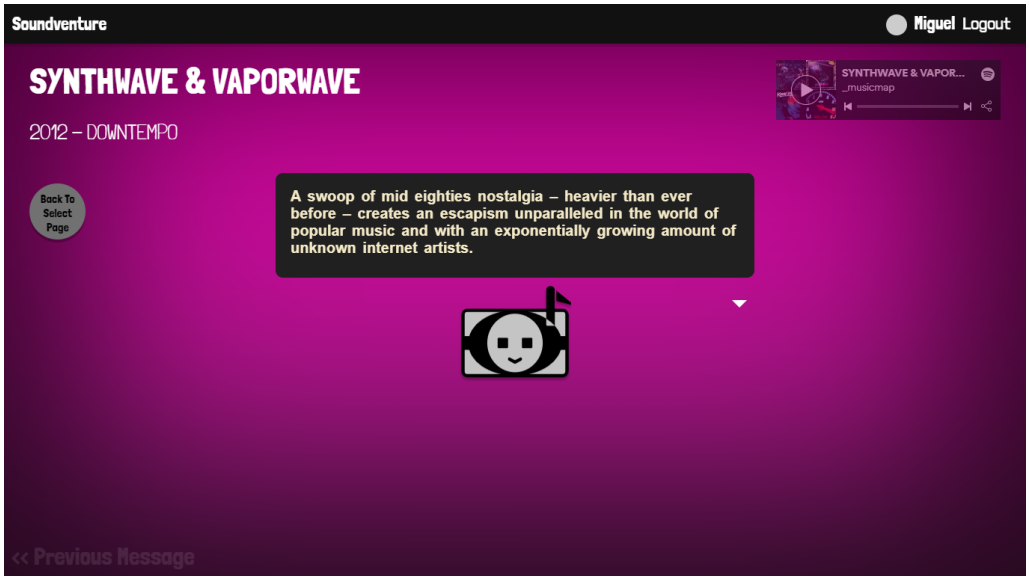


Figure 3.23: Final Changes - Explore Page

- Users had a tendency to immediately login to the website even though they had never registered before, so we made sure to have G remind them to register, as seen on figure 3.24.

- Requiring both users to add each other's tags was an unintuitive process, so a notification system was developed. In this new popup, activated by the bell icon seen on figure 3.25, users could see if they had new notifications like recommendations or friend requests, which they could now accept or decline by simply pressing a button.

Pre-launch participants seemed to enjoy themselves using the platform. Their experiences led them to find genres they found to be remarkable and promoted musical discussion among themselves.

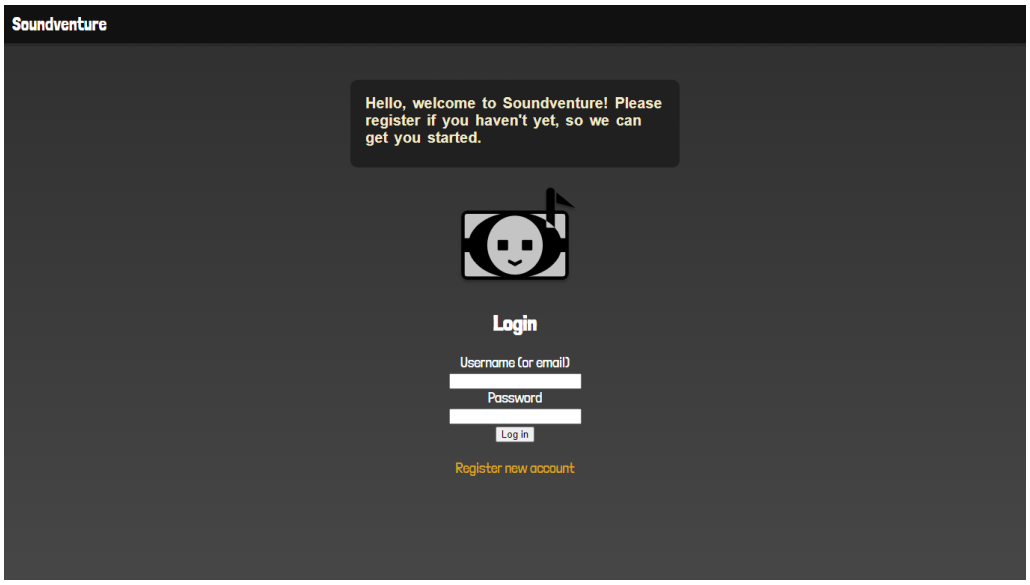


Figure 3.24: Final Changes - Login Page

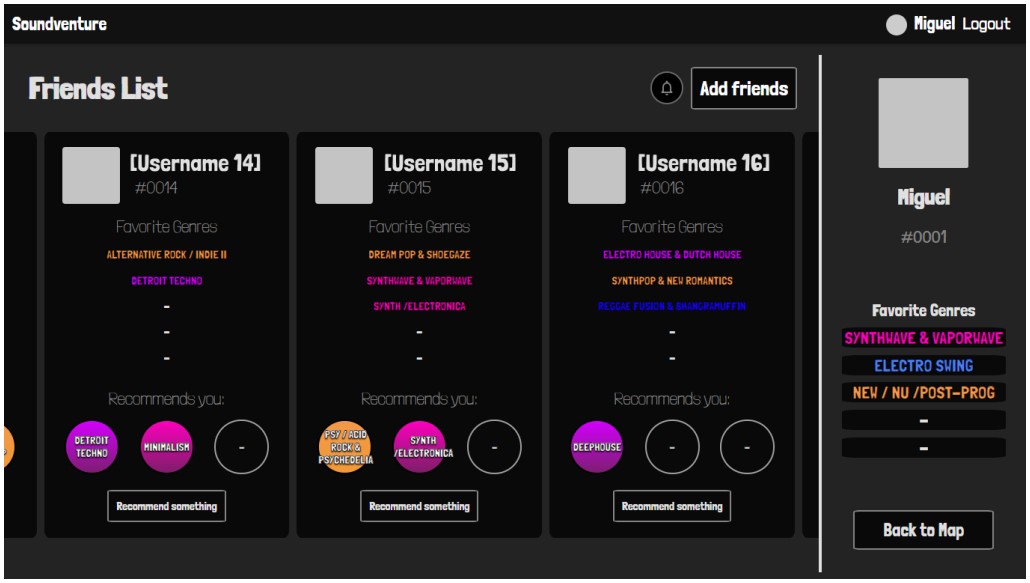


Figure 3.25: Final Changes - Friends Page

At this time, we took the chance to improve the map's graphical design. Division elements were added behind the genres outlining each category of music with their own color, similar to musicmap's layout. We also added names for each category under those elements and a time scale to give the user a visual reference of the genres' era of origin. The final version of the map can be seen on figure 3.26.

The final codes used on the log table to determine metrics and user milestones can be seen on table 3.5.

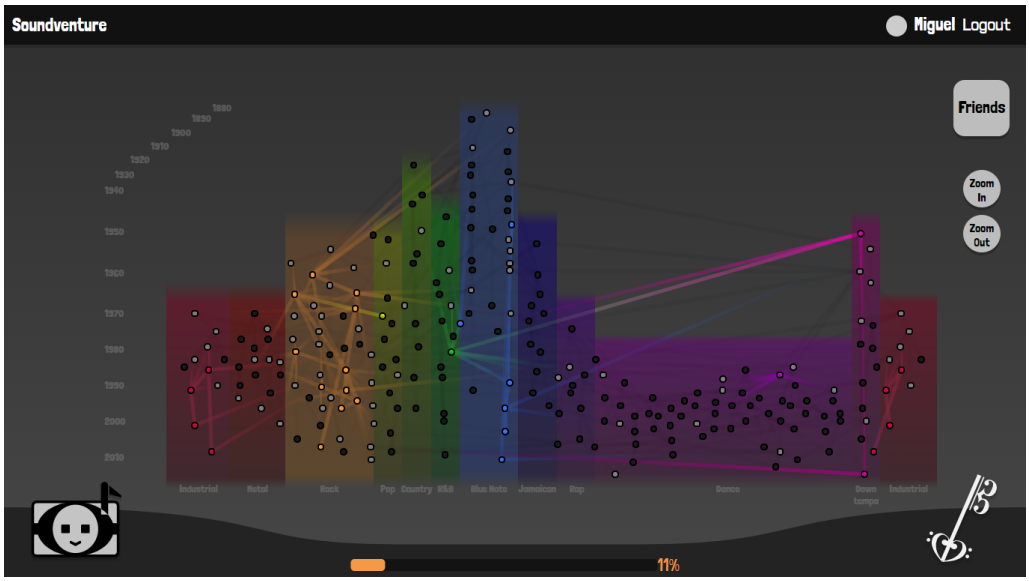


Figure 3.26: Final Changes - Map Page

Lastly, to make the website url more user-friendly we went to freenom.com and acquired a free, more memorable domain for the website - soundventure.ml.

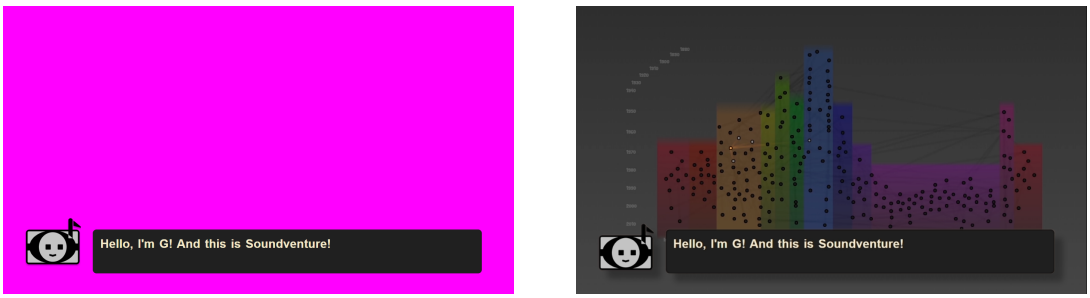
Table 3.5: Development - Log Codes

Log Codes	
reg	User completed registration
lin	User logged in
lout	User logged out
loutINACT	User logged out after 15 minutes of inactivity
lSACT	User began a session
lACT	User session's last update
form1	User completed Entry form
form2	User completed Last Form
cmpl	User completed a genre (specified on the 'genre' column)
clef	User used the Clef Key (to unlock the specified 'genre')
Chosen	User has chosen their first genre (specified on the 'genre' column)
Intro	User completed the introduction and arrived at the map
popup	User dismissed the tutorial popup on the map
frenR	User submitted a friend request (to user2)
frenA	User accepted a friend request (from user2)
recNew	User has made their first recommendation to 'user2' (specified by 'genre','genre2' and 'genre3')
recUpd	User has updated their recommendations to 'user2' (specified by 'genre','genre2' and 'genre3')
fav	User updated their favorites (to 'genre', 'genre2', 'genre3', 'genre4' and 'genre5')
checkNotif	User checked their notifications

3.2.11 Promotional Video

Since the platform was to be shared online, we created a promotional video in order to attract the attention of potential participants. It had G talk about what could be done in the platform while showing the website on the background.

To achieve this, a unique autoplaying story on the website was made using the dialog system. The dialog interface was modified and placed over a magenta background (seen on figure 3.27). Then, we animated a small text logo and made every component move, fade and pop in at the right time.



(a) Magenta Background (b) Chroma Keyed Result

Figure 3.27: Promotional Video - Chroma Keying Dialog

We screen-captured the final story animation and used a chroma key to replace the magenta background with the appropriate website recordings. Later on, we also created the background music and sound effects and synchronized them with the video. After designing a thumbnail, the video was uploaded to Youtube and later shared on the first day of the study.

3.2.12 Mobile Placeholder

Before making the website widely available, there was still one issue to fix. The zoom function on the map did not support touch controls, making it unsuitable for mobile use. To prevent users from accessing the website through mobile devices, they were redirected to a new page using the Mobile Detect library. This new page, seen on figure 3.28, had G inform the user that the website was not available on mobile devices and urged them to visit Soundventure on a desktop.

3.2.13 Analytics

Since there was no way of checking if people were having problems with their registration, we added Google Analytics support to the Login page. This way we would be able to tell if there was a stark difference between the amount of people who landed on that page and the amount of users registered on the platform.

Support for the mobile page was added as well, as a way to keep track of how many times people tried to access Soundventure on a mobile device.

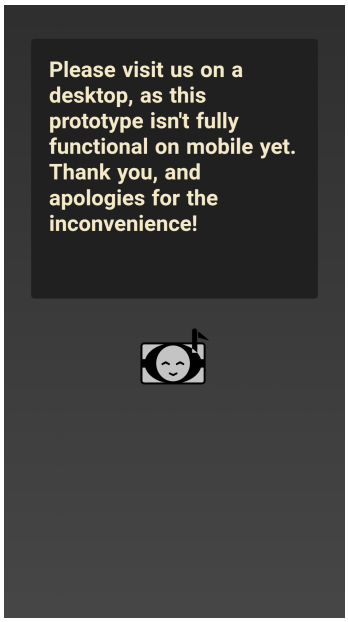


Figure 3.28: Mobile Placeholder

3.2.14 Social Media

We came up with a plan to use social media as a soft reminder of the platform's existence throughout the following two weeks. Two sets of posts were outlined for the Instagram main page: *Fun Facts!* and *Genre Spotlights*. *Fun Facts!* would focus on interesting trivia about what went into creating Soundventure. These were told in multiple-image posts - which is a format often used for webcomics on Instagram - in a style that mimicked Soundventure's dialog. *Genre Spotlights* highlighted three genres a day through Instagram Stories sampling one music track from their playlist and displaying their relative position on a streamlined version of the Soundventure map.

Every *Fun Facts!* post was created on the 20th of May, the third day of the study, along with the schedule and the *Genre Spotlight* template. The *Genre Spotlight* stories were determined and created throughout the week. Genres were chosen along the way mostly by personal preference, but with an effort to show only one of each category and diversify the era of origin whenever possible. This schedule can be seen on figure 3.29 and the remaining posts can be seen on Appendix D.

Later on, a Facebook page was also created to reach another kind of audience. This page mainly repeated the *Fun Facts!* posts and hosted links to the main website and the Instagram page.

No clear link was established between the timing of these posts and returning visitors.

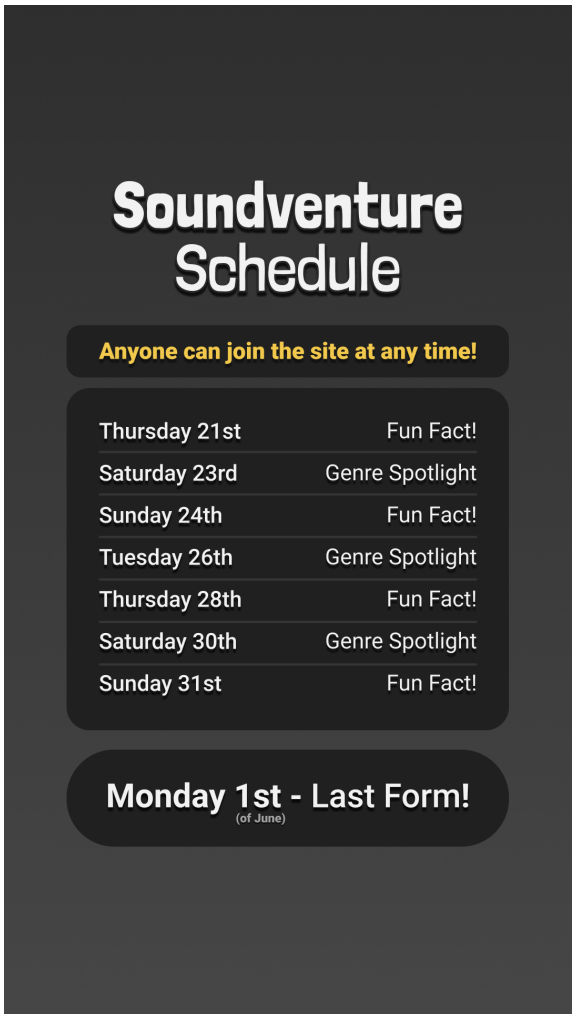


Figure 3.29: Social Media - Schedule Story

3.3 Evaluation

3.3.1 Questionnaires

Two questionnaires were drafted as part of the evaluation process: the entry and last forms. The experience was meant to run entirely online for two weeks, so the entry form (seen on Appendix A) would be available from the start and the last form (seen on Appendix B) would be shown at the end of this time period. These would be displayed on the platform itself to avoid rupturing the experience and keep the study running seamlessly from the Soundventure website. Due to social distancing policies put in place this year - 2020 - there was not a lot of leeway when it came to contacting participants. Having a second form so long after the participants' first visit was always bound to lack the same amount of adherence. However, since this platform was meant to evaluate - in part - the long-term effectiveness of the employed design, it was essential to have enough time for users to explore a fair amount. By having both forms on the platform itself, it would maximize their exposure to anyone who came in contact with the website, making it easier to share Soundventure's study with others as well.

The entry form collected profiling information, helping us understand what kind of participants were joining the platform and how their differences influenced their behaviour. First we asked general questions like their age and English fluency and then more specific ones about their knowledge of music genres, gamification and their experience with video games.

The last form focused on participant feedback, going step by step on the effectiveness of each element of Soundventure's design.

Users were informed of how their data would be utilized at the time of registration (disclaimer shown on Appendix E).

3.3.2 Study

On the 18th of May, the project was shared on personal and public social media. The shared posts included the promotional video, as planned, and a link to the prototype. This first day was useful primarily to gauge responses from the public and troubleshoot any problems that arose. We took the chance to scale up the website plan so that it could handle more traffic and support an SSL certificate. This would make it so the website could be accessed through an HTTPS version, preventing it from showing up as insecure on most browsers which could have dissuaded some potential participants from using it. Google Analytics support was added on more pages as well, so that we could have another record of user behavior to fall back on. It also helped us monitor when people were accessing the website in real-time and which pages they were on.

With these changes in place and everything ready to go, we sent an email on the following day to a University of Porto student mailing list. In it, there was a link to the prototype and another to the main Instagram page, so that users could share it easily between friends. Following this email, the number of registered users raised very quickly and soon enough hit around 150 users.

On the day after the test period was over, the last form was made available on the website taking priority on the redirection logic (seen back on figure 3.19). Emails were sent to inform the registered participants over the following days.

3.3.3 Data Analysis method

Jupyter Notebook, along with *pandas*, a Python data analysis library, were used to analyze the data. Notebook templates were made for the Entry Form data, the metrics data and the Last Form data, that retrieved and processed information from the SQL database. Changing the initial SQL query would determine which population would be analyzed. Form notebooks would illustrate the proportion of answers for each question, while the metric notebooks would highlight relevant statistics seen below:

- Days Registered were counted by taking each participants' *"reg"*-coded log entries and calculating the difference up to June 8, the day the database was retrieved.
- Days Visited were calculated by counting the number of days that had any log entries made by this user.
- Login Number is calculated by the sum of *"lin"*-coded log entries attributed to a user.
- Session Number was calculated by counting the resulting number of sessions mentioned before.
- Session Time was calculated using *'lACT'*, *'lSACT'* and *'loutINACT'* log entries for each user. A session would be determined by the difference between the timestamps of an *'lSACT'* entry and the following *'lACT'* entry. If a *'loutINACT'* entry existed, then 15 minutes were removed from the latest session time.
- Completed Genres were calculated by the sum of every entry on the "completed" table (completed genre) attributed to a user.

Chapter 4

Results and Data Analysis

The data collected from the Soundventure experiment will be shown throughout the following pages, closing with a discussion on the obtained results.

Soundventure was made open to the public on the 18th of May. For the duration of two weeks, the website would be receiving participants and registering their data. Soundventure remained open after that time period, but any new users were not added to our study's pool of data. The platform's database was retrieved on the 8th of June, a week after the test period was over, making that the cutoff date for our results.

4.1 Participant Characterization - Entry Form Results

Out of 183 users who registered on Soundventure, 171 participants proceeded to fill out the entry form. Out of those who answered the form, the age gap spanned from 17 to 72-year-olds, with a mean value of about 24 years and a standard deviation of 7.98.

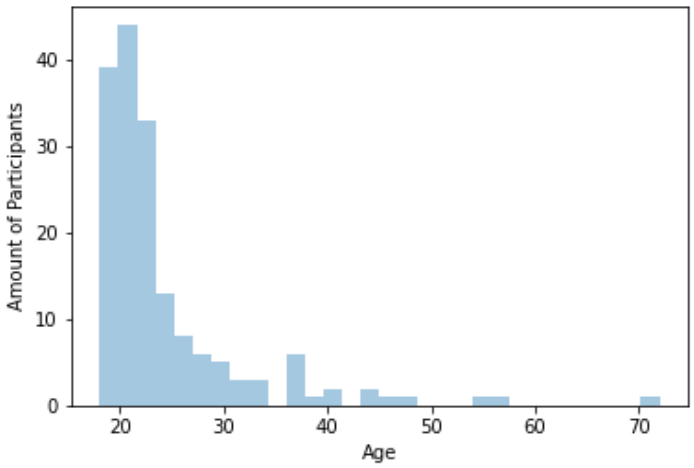


Figure 4.1: Participants' Age Distribution

When asked about their comfort with the English language in a scale of 1 to 5 with 5 being "completely comfortable", the mean result was around 4.64 with a standard deviation of 0.76. This means that, in theory, most users would not be affected by a language barrier.

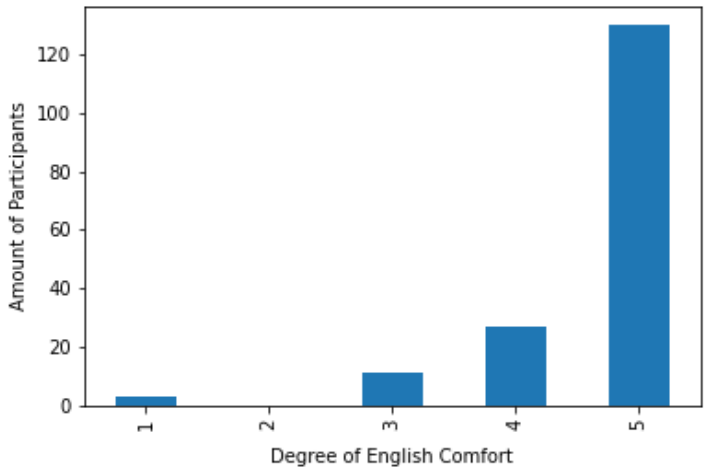


Figure 4.2: Participants' English Comfort

Only 20 participants (11.70%) were unfamiliar with the concept of music genres (figure 4.6, left), 81 (47.37%) had never worked or studied music before (figure 4.7, left), 108 (63.16%) were unfamiliar with the concept of gamification (figure 4.9, left), and 16 (9.36%) had never played video games before (figure 4.10, left).

Out of the participants that studied music (90 users), 6 users (6.67%) had done so for less than a year, 38 users (42.22%) between one to four years, 21 users (23.33%) between five to seven years and 25 users (27.78%) studied for eight years or more (figure 4.8, left).

Out of the participants that were familiar with gamification (64 users), only 23 users (35.94%) had used a gamified platform before. And out of those (23 users), 18 users (78.26%) stated they were helpful in motivating them to do the intended tasks.

From the user group that had played video games before (155 users), 15 users (9.68%) stated they were not well acquainted to how they worked, 49 users (31.61%) stated they were only somewhat acquainted and the remaining 91 users (58.71%) claimed to be well acquainted (figure 4.11, left). This same user group also had 12 users (7.74%) said they never played any games with dialog boxes, 56 users (36.13%) had only played a few, and the remaining 87 users (56.13%) had played several (figure 4.12, left).

Lastly, out of all 171 participants, 162 users (94.74%) said that their platforms of choice for listening to music helped them find new music. Those 162 users were then asked if they found their new musical options to be novel and diverse: 35 users (21.60%) stated that they did, and often came across many different styles of music; 77 users (47.53%) stated that they sometimes did, and would come across a style of music they never heard before every now and again; Another 35 users

(21.60%) claimed to only rarely find novel and diverse options, having to search very deliberately in order to find something like that; The remaining 15 said they never found their options to be novel and diverse since they usually circled around styles of music they were already familiar with.

4.2 Userbase throughout the experiment

Figure 4.3 is a representation of Soundventure's userbase, splitting them into different groups based on what milestones they achieved.

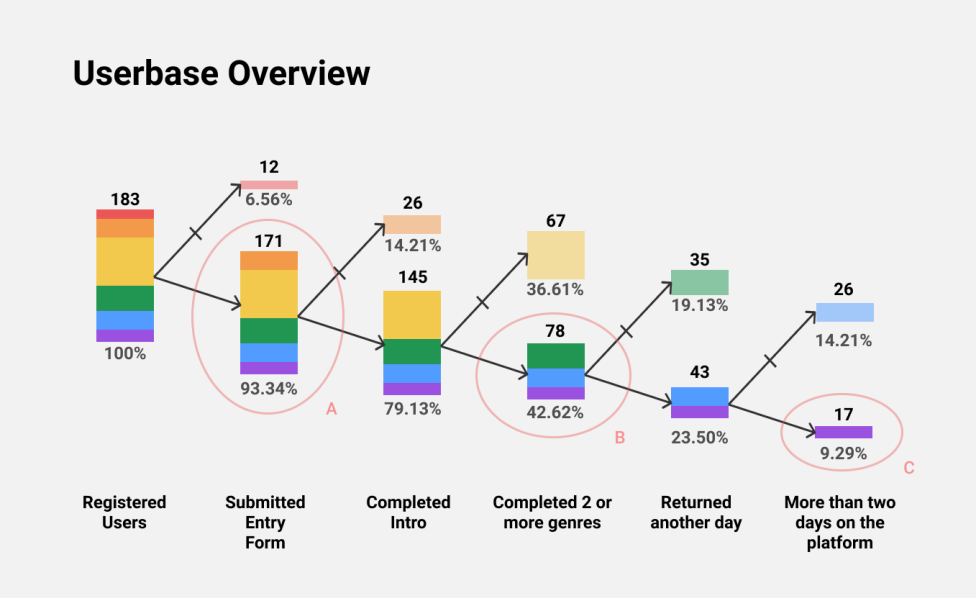


Figure 4.3: Soundventure's Userbase
Populations A, B and C are circled in order from left to right

Between the 18th of May and the 1st of June, 183 participants registered into Soundventure. Up until the 8th of June, 171 participants (93.34%) submitted the entry form, meaning that 12 of them (6.56%) dropped off before finishing the form or even before logging into the website. Of those 171, 145 participants (79.13%) completed the introduction, meaning that 26 participants (14.21%) left before reaching the map. From there, 78 participants (42.62%) engaged with the map and completed another genre, while 67 (36.61%) dropped out before unlocking more genres. Out of those who explored the map, 43 participants (23.50%) returned to the platform again on another day, with 35 (19.13%) having only a single day logged in on Soundventure. Lastly, 17 of the participants who returned (9.29%) had more than two days logged in on the platform while the other 26 (14.21%) remained with only two. Hence, during its two week run, Soundventure had a retention rate of about 9.29%.

We have chosen two subsets of this population to compare against the previous entry form results:

- The first subset was the group of users who completed two or more genres, since they included everyone that went on to interact with the map - the main experience - after the introduction.
- The second subset was the group of users who continued to return to the website at a later date.

We will be referring to the original group of 171 users as population A, the group of users with more than two completed genres as population B and the group of users with three or more days on the platform as population C. With these two new groups we can highlight what kind of users were driven to complete more of the map and how that composition changed when it came to revisiting the website.

Age narrowed into the 18 to 32 zone, which was expected since it was the range with a greater amount of people (figure 4.4).

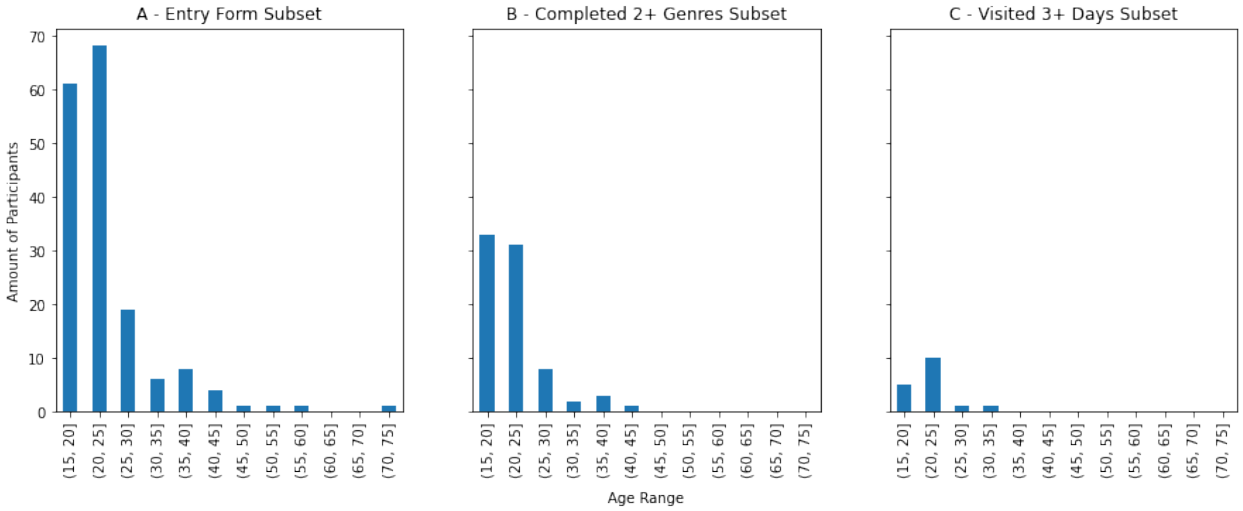


Figure 4.4: Comparing user ages between populations

English Comfort narrowed to values of 4 and 5, which was also expected since the platform was entirely in English (figure 4.5).

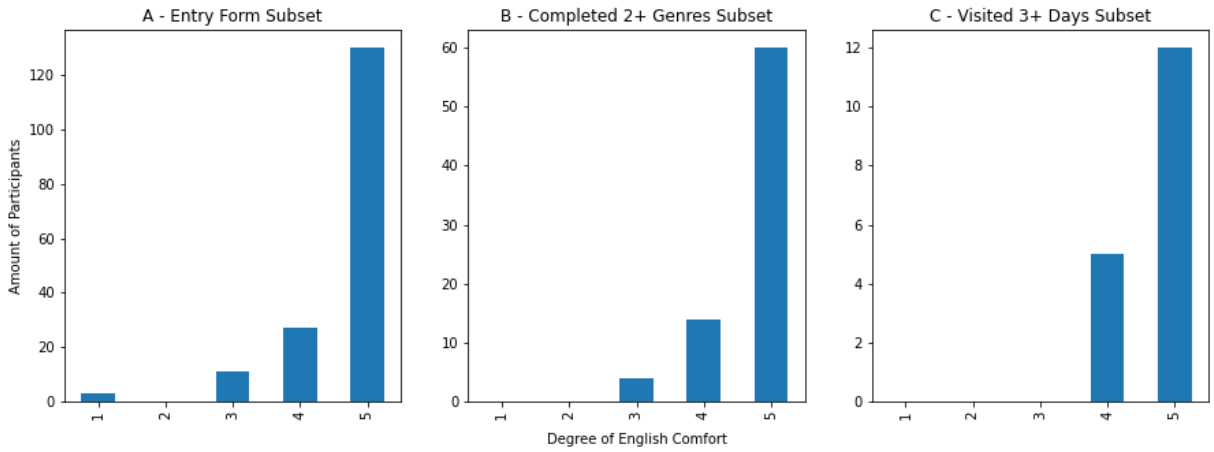


Figure 4.5: Comparing English comfort between populations

Proportion of people ***unaware of music genres as a concept*** grew in comparison to those who were aware (1% from A to B, 11% from B to C) (figure 4.6).

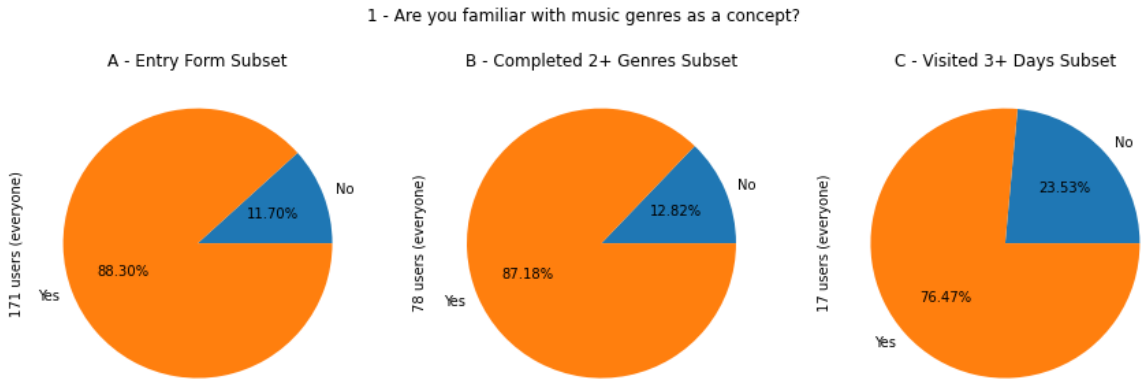


Figure 4.6: Comparing users' familiarity with music genres between populations

Proportion of people who ***had not studied or worked with music before*** grew in comparison to those who did (5% from A to B, 0.5% from B to C) (figure 4.7).

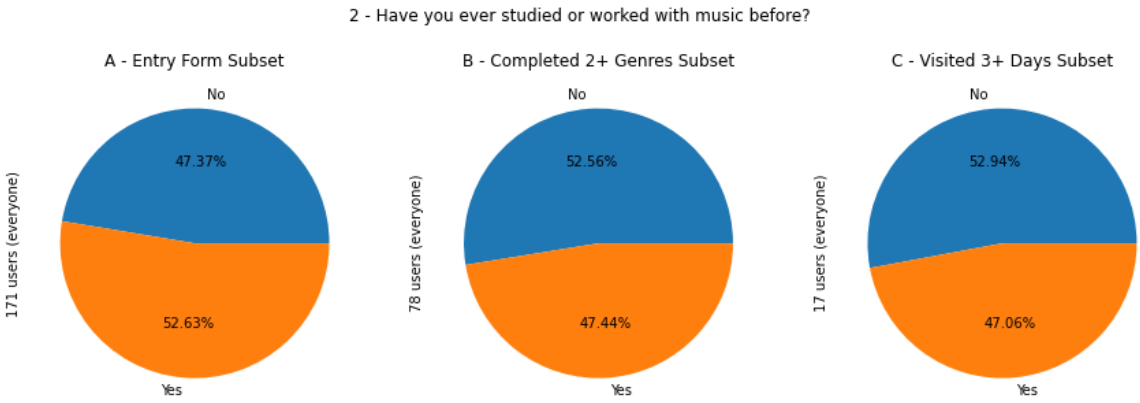


Figure 4.7: Comparing users' musical qualifications between populations

Out of those who studied music (figure 4.8):

- Proportion of those who **studied less than a year** grew by 3.5% between A and B, and 1% between B and C
- Proportion of those who **studied one to four years** shrunk by 2% between A and B, and 18% between B and C
- Proportion of those who **studied five to seven years** shrunk by 0.8% between A and B, and 0.3% between B and C
- Proportion of those who **studied 8 years or more** shrunk by 0.3% between A and B, and then grew by 17% between B and C

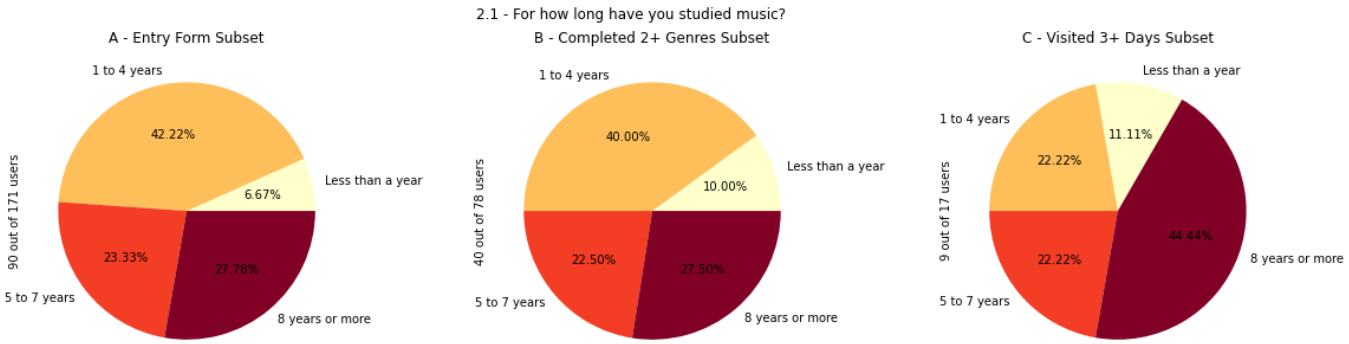


Figure 4.8: Comparing users' musical study time between populations

Proportion of participants ***unaware of the concept of gamification*** shrunk in comparison to those aware by 3% between A an B, and then grew by 16% between B and C (figure 4.9).

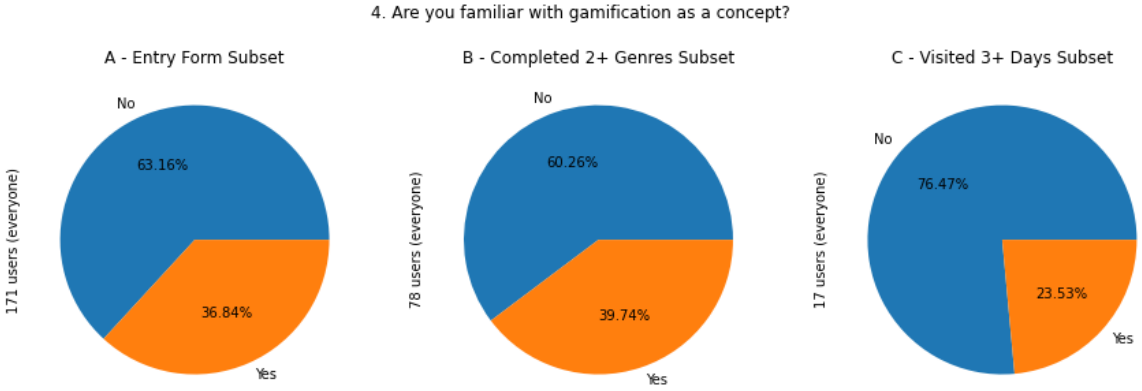


Figure 4.9: Comparing users' familiarity with gamification between populations

Proportion of participants who ***never played video games*** shrunk in comparison to those who did by 4% between A an B, and then grew by 7% between B and C (figure 4.10).



Figure 4.10: Comparing users' video game experience between populations

Out of those who played video games, regarding acquaintance with them (figure 4.11):

- Proportion of those **unacquainted with how video games work** shrunk by 5% between A and B, and another 5% between B and C. Meaning that none of them visited the platform for three or more days.
- Proportion of those **somewhat well acquainted with how video games work** grew by 2% between A and B, and 13% between B and C
- Proportion of those **well acquainted with how video games work** grew by 0.8% between A and B, and then shrunk by 8% between B and C

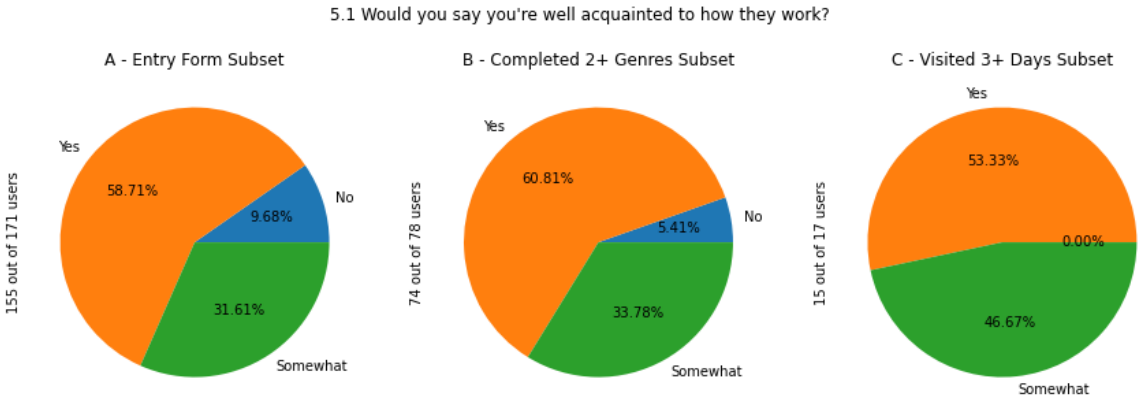


Figure 4.11: Comparing users' acquaintance with video games between populations

Out of those who played video games, regarding dialog boxes (figure 4.12):

- Proportion of those who **never played video games with dialog boxes** shrunk by 6% between A and B, and 1% between B and C. Meaning that none of them visited the platform for three or more days.
- Proportion of those who **played a few video games with dialog boxes** shrunk by 2% between A and B, and then grew by 13% between B and C.
- Proportion of those who **played several video games with dialog boxes** grew by 9% between A and B, and then shrunk by 11.5% between B and C.

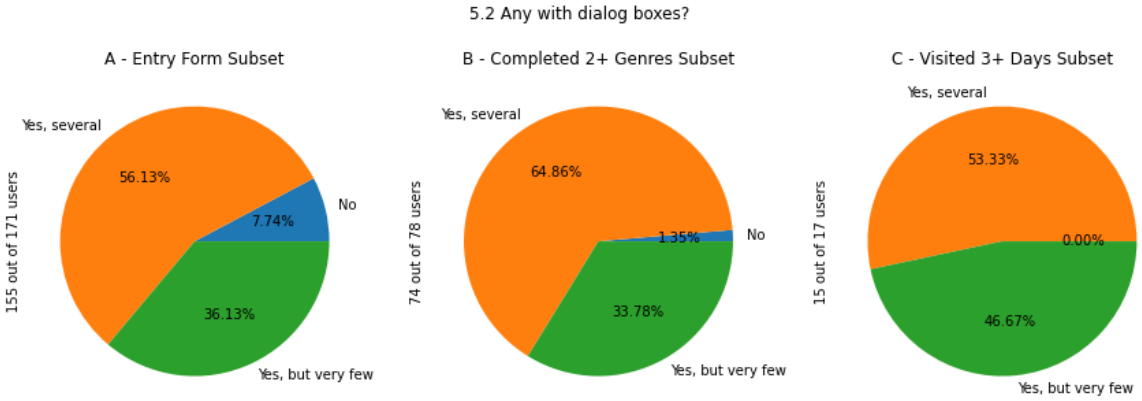


Figure 4.12: Comparing users' acquaintance with dialog boxes in video games between populations

4.2.1 Analyzing Population C - 3 or more days on the platform

The individual statistics of the population with three or more days on the platform can be seen on table 4.1 while overall statistics like mean and standard deviation are shown on table 4.2. Since users (namely their usernames) can be found on the website through their friend tags, we have assigned them new numbers in this analysis to prevent cross-referencing data that might identify them.

Most users registered on the second day of the study, which was the day the emails to the student mailing list were sent. The remaining three users registered later on the third, eighth and tenth day of the fifteen-day study. These last three visited the website just three times.

The mean number of days visited was 4.7 days with a standard deviation of 3.1. The minimum value as well as the median was 3, with a maximum value of 15 days (9 users returned 3 days, 4 users returned 4 days, 2 users returned 7 days, one user returned 8 days and another one returned 15 days).

The mean number of completed genres was 21.35 with a standard deviation of 30.72. The median was 9 genres and the max value was 106 genres out of a possible 234 genres.

Users 2 and 15 (from table 4.1) regularly skipped genres, meaning that they completed many genres at once within less than two minutes apart.

As a comparison, table 4.3 shows the overall statistics of everyone who completed the entry form.

Table 4.1: Population C - Individual Statistics

user	Days Registered	Days Visited	Logins	Sessions	Session Time Mean	Completed Genres
1	19	15	37	44	12:42	90
2	19	3	4	4	10:42	14
3	19	7	11	12	21:28	42
4	19	4	7	7	38:05	5
5	19	3	3	2	06:11	3
6	19	4	7	5	32:30	14
7	19	7	17	15	10:59	17
8	19	3	3	4	13:55	10
9	19	3	12	13	09:52	2
10	19	8	17	20	11:09	9
11	19	3	7	6	22:32	27
12	19	4	5	6	12:07	3
13	19	3	7	20	01:34	6
14	19	4	11	7	36:32	5
15	18	3	3	8	12:20	106
16	13	3	4	5	02:17	5
17	11	3	4	3	06:50	5

Table 4.2: Population C - Overall Statistics

	Days Registered	Days Visited	Logins	Sessions	Session Time Mean	Completed Genres
mean	18.117647	4.705882	9.352941	10.647059	15:23	21.352941
std	2.342070	3.117786	8.447937	10.234386	11:07	30.718360
min	11.000000	3.000000	3.000000	2.000000	01:34	2.000000
25%	19.000000	3.000000	4.000000	5.000000	09:52	5.000000
50%	19.000000	3.000000	7.000000	7.000000	12:07	9.000000
75%	19.000000	4.000000	11.000000	13.000000	21:28	17.000000
max	19.000000	15.000000	37.000000	44.000000	38:05	106.000000

Table 4.3: Population A - Overall Statistics

	Days Registered	Days Visited	Logins	Sessions	Session Time Mean	Completed Genres
mean	18.140351	1.584795	2.461988	2.432749	07:21	5.087719
std	1.907619	1.470335	3.670633	4.756405	09:43	13.030210
min	11.000000	1.000000	1.000000	0.000000	00:00	0.000000
25%	18.000000	1.000000	1.000000	1.000000	00:07	1.000000
50%	19.000000	1.000000	1.000000	1.000000	03:52	1.000000
75%	19.000000	2.000000	3.000000	2.000000	10:43	3.000000
max	20.000000	15.000000	37.000000	44.000000	55:19	106.000000

4.3 User Feedback - Last Form Results

From the last day of the study onward, a new form was available on Soundventure that aimed to collect user feedback. Figure 4.13 is based on the groups found in figure 4.3 showing the percentage of users who answered this form compared to the overall amount of registered users. The percentages found on the following sections apply to the 30 users that answered the last form.

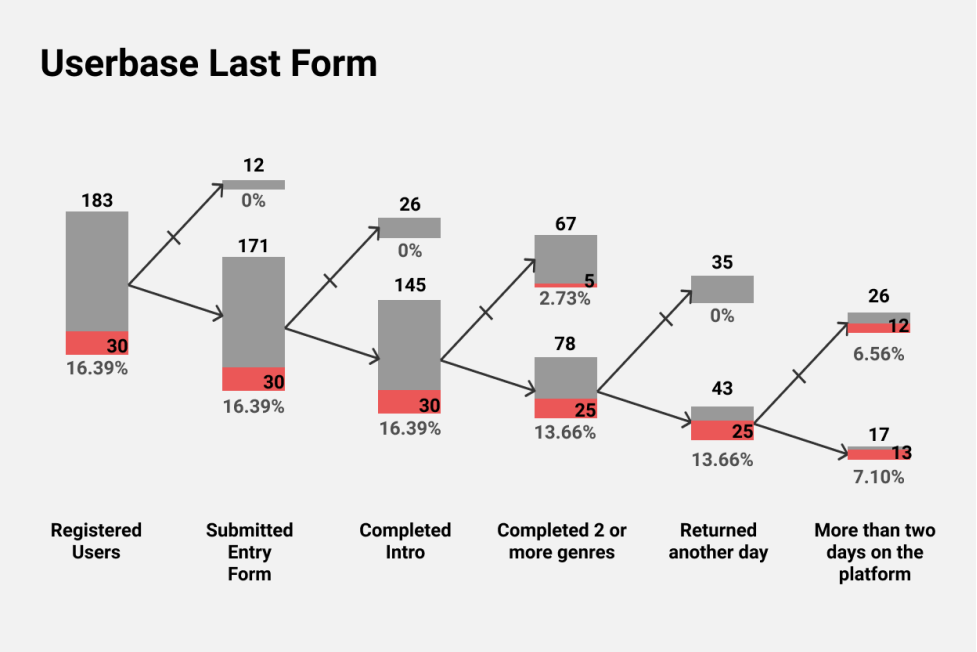


Figure 4.13: Soundventure's Userbase - Last Form

4.3.1 Quality of the Experience - Exploring and Discovering Music

When it comes to the quality of the experience, 90% of users found Soundventure to be enjoyable, with the remaining 10% choosing the middle ground option: 'meh'. When asked about what could be improved to make it more enjoyable, a few users said that text could have been toned down or not so relied upon and that overall design could be improved. One user mentioned that a lot of classical and world music was missing and should be expanded upon while others suggested the inclusion of other gamification elements like quizzes and leaderboards.

About 93% of users (28 out of 30) stated that Soundventure led to novel musical discoveries, with 82.14% of those (23 users) planning on listening to those new genres more often. Around 83.33% of users (25 out of 30) stated that Soundventure led to rediscovering music they had not heard in a while, with 92% of those (23 users) planning on listening to those new genres more often. The majority of users, 90%, stated that Soundventure led them to learn more about music they were already familiar with.

Half the users found both positively and negatively remarkable music in Soundventure, with 30% finding only positively remarkable and 3.33% finding only negatively remarkable. The remaining 16.67% found it all quite unremarkable.

4.3.2 Choices and Structure

The majority of these participants (96.67%) found the use of a genealogy map to sequentially unlock genres an effective way to explore music. When compared to *musicmap*, 76.67% claimed that having everything unlocked from the start would not have been as effective of a method to explore music, with 16.67% saying it would have been the same thing. The remaining 6.67% claimed that having every genre unlocked from the start would have been the more effective method.

As for the Clef Key, 66.67% of users did not use it, with 33.33% only using it once or twice. Around 80% said the clef key was not an essential part of the platform, but that it was a nice option to have. As for the rest, 16.67% said that it was essential and the remaining 3.33% said that it was unneeded.

When asked if they ever felt overwhelmed by choices at any point of the experience, 13.33% said that they did, and all agreed that it was due to the first list of genres presented on the intro.

4.3.3 Social Mechanics

Only 20% of this population - 6 users out of 30 - added friends to Soundventure. These next few statistics will pertain to this group:

- Out of the 20% who did add friends, half of them claimed this enhanced their experience while the other half said it would have been the same without it.
- Of that same group, one third of them set favorites, another third did not and the remaining third was not aware that was possible.
- All six users of that group used the recommendation system. Half of them used it only to check for recommendations, two of them used it only to send recommendations and the remaining participant used it for both of those.
- Half of them found new or remarkable music through either recommendations or friend favorites.
- None of the users found that the friends system stirred up interest in genres that they would not otherwise seek out.

Out of the 80% who did not add friends, 20.83% (5 users) were unaware that was an option, 25% (6 users) did not see a reason to add friends, and 33.33% (8 users) did not know anyone else registered on the platform.

4.3.4 Story-based Gamification

Most participants (93.33%) agreed that the introductory sequence enhanced their experience, while the remaining 6.67% would rather skip to the map from the start. This sequence was outlined by four steps: introducing G and the platform, exploring a familiar genre, introducing the story premise and only then have access to the map.

A great amount of participants (83.33%) agreed that the introductory narrative enhanced their experience. Besides them, 10% said it made no difference, 3.33% said they would rather not have it and the remaining 3.33% said that, while cute, it did not impact their experience later on. These statistics relate solely to the premise chosen for the platform, which had G "download the internet" and rely on the user to put the map back together.

All the participants agreed that G makes the platform more engaging. Yet 20% said that G was sometimes intrusive, and 3.33% said it was intrusive all the time.

4.3.5 Returning Visitors

Around 70% of users that responded to the last form (21 participants out of 30) claimed to not have returned to Soundventure as much as they would have liked. Out of those, 85.71% (18 participants) said they did not have the time to visit, otherwise they would have.

About 13.33% of users (4 participants out of 30) said that they did not return to Soundventure regularly. Out of those, 50% (2 participants) also reported not having had the time to visit and that they would otherwise.

4.3.6 Mobile Version

When it comes to the possibility of a mobile version, 53.33% (16 users) agreed that they would have liked the option, 13.33% (4 users) said they would have preferred one over the desktop version and the remaining 33.33% (10 users) stated that it would not have made a difference.

Additionally, by looking at the Google Analytics records on figure 4.14, it is possible to see that the mobile placeholder (*/mobile.php*) is one of the pages with more views and the second one that people most landed on during the test period.

4.3.7 Real World Impact

When it comes to real world impact, 76.67% participants said that Soundventure changed how they used to see certain genres of music.

Around 83.33% participants said that it enticed them to search for and learn more about new music on other platforms.



Figure 4.14: Analytics Records - Mobile Page visits

4.3.8 Future Usage

The majority of participants (93.33%) said that they would continue to use Soundventure. Of the remaining 2 users who did not, one said that they did not like it and the other said they had enough fun already.

Lastly, participants were given the chance to leave an optional final comment. Five of them reached out to say that they really enjoyed the experience.

4.4 Discussion

First we will be focusing on the audience characterization, analyzing what kind of users the platform attracted and catered to. It should be noted that, as audiences drop off, percentages become more volatile as there are less users to draw information from. As such, changes between populations A and B carry a different magnitude than changes between populations B and C. We will then move on to the last form feedback to ascertain the effectiveness of each of the website's elements.

4.4.1 Audience Characterization

Setting aside *Age Groups* and *English Comfort*, when it comes to the factors chosen to set users apart, **the Soundventure audience did not seem to change considerably in proportion**. This leads us to believe that this prototype has widespread appeal regardless of user variance in these aspects.

Population A's age group was mostly in the 18 to 25 years old demographic. While it may be possible that Soundventure has a higher chance of captivating this group, it is important to note that the main channels used to share the website (student email, personal social media) already had a tendency to reach this demographic over others. Since this group was much larger, it is not out of the ordinary that the age spread narrowed down towards this demographic as the number of participants whittled down.

The majority of users were comfortable with English, which is reasonable since the website was entirely in English and relied heavily on text. By that same logic, it is understandable why only comfortable users remained. Not only were non-English speakers a minority, Soundventure would not have the same appeal to them.

As for the remaining factors, we should highlight that there was a slightly higher chance to proceed through the platform if:

- a user who had played video games before was somewhat or well-acquainted with how they work
- a user who had played video games before had played games with dialog box systems

4.4.2 User Feedback - Element Evaluation

The majority of participants who answered the last form found the website to be an enjoyable experience. They also claimed to have discovered and rediscovered music that was both positively and negatively remarkable and were now planning to listen more of those genres of music. They found the method of unlocking music genres through a genealogy map to be an effective form of exploration, along with the introductory sequence that begins with a genre of choice. Every participant in this form found G to make the platform more engaging and the majority of them found the narrative to enhance their experience. This leads us to infer that the narrative/character elements were well implemented and contributed to the overall appeal of the platform. On the other hand, social features received more mixed results. Not many participants made use of them with some of those users not knowing that they existed. Out of those who did, only half of them found examples of remarkable music through friends. We acknowledge the possibility that these could further be improved upon to reach their full potential.

When it comes to real world impact, most users found that Soundventure changed how they perceived certain genres of music. It enticed them to search for and about music on other platforms. Therefore, we deem that our prototype was successful in providing a meaningful impact beyond its own scope. It fostered knowledge and curiosity that people could now carry and apply to their lives from that point forward.

Lastly, regarding user retention, most of the participants that claimed they did not return to Soundventure regularly also stated that they would have liked to have done so. Out of those, most pointed to a lack of available time as the reason. Additionally, two thirds of the queried users claim they would have used and appreciated a mobile version of the website. This is supported

by the amount of visits the mobile placeholder page registered on Google Analytics. Despite the participants' lack of time, we theorize that a mobile version would greatly improve user retention.

In the event that any supplementary data is found to be relevant after the submission date stated in this document, it will be added to this folder.

Chapter 5

Conclusion

Throughout this study, we have pondered over the current state of music availability. The amount of music waiting to be discovered is staggering and it only keeps growing - both in quantity and diversity. We have seen that the current methods of finding music are ill-equipped to provide an active form of exploration leading to limitations like the filter bubble phenomenon. As a solution, we proposed a gamified experience designed around a genealogical map-like structure. This aimed to foster musical exploration, by making use of the compact placement of related genres and their influential historical connections while simultaneously minimizing the feeling of overwhelming choice. We set out to accomplish three main objectives: guide, promote and diversify music discovery. Was our solution successful in achieving these goals?

Participants using Soundventure found its method of music exploration to be enjoyable and effective. It led them to all kinds of remarkable music, both novel examples and others they had forgotten about or never took the time to properly listen. Unlocking genres on the map was an effective method with which to provide discoveries while minimizing the anxiety of choice. On that note, tying progression to genealogical influences made for a coherent sequence as well, effectively ***guiding*** users through the content throughout their experience. Soundventure enticed visitors to discover and learn more about music either through the premise put forward by our character G or by having them journey towards a genre on the map that caught their eye. Finding a representative playlist on every genre was also a good factor in ***promoting*** these discoveries, leading many users to pursue their findings outside of the platform. Users ventured outside of their zone of comfort, discovering music that sometimes fit their tastes but other times clashed with them. In the end, most found remarkable genres of music that they were now inclined to listen more of, effectively ***diversifying*** their repertoire.

In light of what has been mentioned before, we can affirm that Soundventure was successful in achieving the goals we set out to accomplish. With that, we feel confident in providing an answer to the question of whether or not a gamified experience can promote open exploration and lead to remarkable discoveries - that answer is yes.

Notwithstanding, a few aspects on this study could have been polished to better establish participant characterization. For instance, a few more questions could have been asked about their predisposition to look out for novel music. We attempted to address this by asking how many genres they listened to in a week and a month, but since almost nobody claimed to listen to 2 or less genres on both accounts, that result ended up being rather inconclusive. This would have helped factor in how intrinsic motivation affects a user's behavior.

The method used to inquire and collect data from participants was designed to run for two weeks to allow participants some time to explore the platform, evaluating their experience at the start and endpoint. It was also planned this way to circumvent confinement measures put into place due to COVID-19. In a way, we believe this led us to a larger amount of participants, but on the other hand, not all of them made it to the last form. This can be due to many reasons - either because of problems they encountered on the website that went unreported, lack of interest in the study, or communication flaws like follow-up emails being redirected to spam folders. If the study were to be repeated in a similar model, proper communication protocols (e.g. email validation) should be researched and established to ensure that the study information reaches every interested party and keeps them engaged. Of course, without COVID-19, other methods open up that may be better suited to enact this research.

On the prototype, the initial choice G places on the user was still found to be somewhat overwhelming. In hindsight, this could have been softened further by first asking what category the the user most identified before asking genres directly. By doing so, we would have easily reduced the amount of genres presented at the start while still keeping the same amount of options available to all users.

Another thing that could have been expanded upon was the degree of variation that users went through. How much did each participant stray from their initial tastes? We had planned to determine this in two ways. One by asking their favorite genres on the entry form and comparing that with their progress. The other would be by measuring the paths travelled from the initial node of entry on the map by using Dijkstra's shortest path algorithm (Cormen et al., 2009). We ended up not pursuing these avenues due to time constraints in the analysis process, but there was definitely an opportunity to do so within the scope of this project.

5.1 Future Directions

One of the most interesting aspects to pursue from this point on would be methods of presenting genres more effectively within this format. Instead of relying so much on text, solutions like the ones discussed in previous sections could help the platform immensely when it comes to engagement and memorability. The Explore pages could use images or videos to set the scene, or schematics as a visual aid. Unique soundbites could be added to express some musical idea or transmit some important intramusical characteristic. There could be more interactive opportunities within these pages, like the ability to ask G different questions leaving the sequence of information up to the player (figure 5.1).

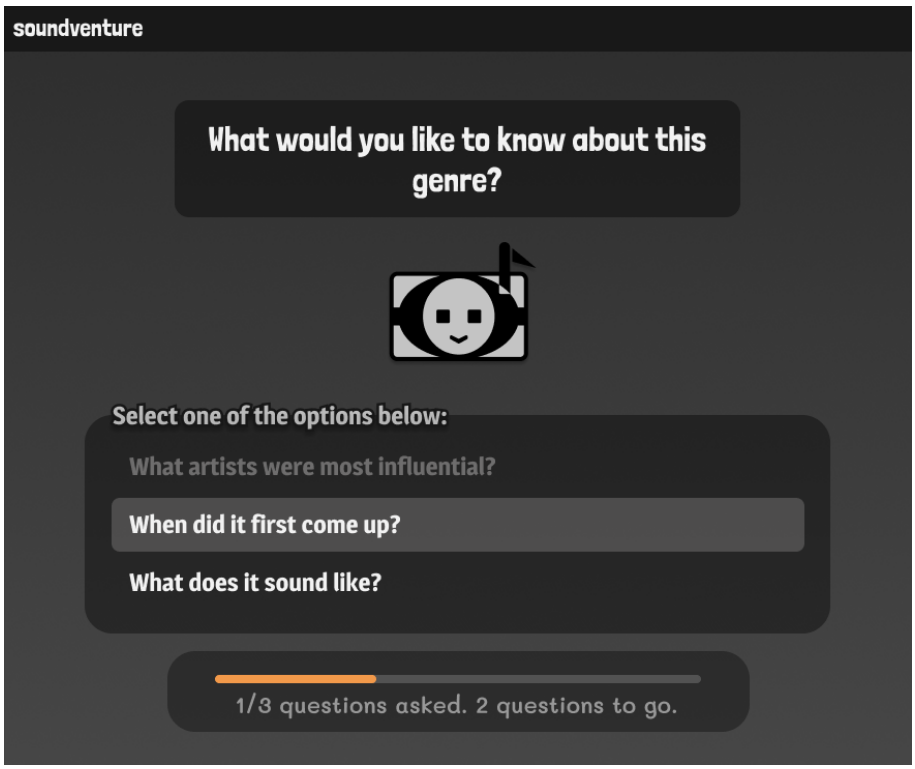


Figure 5.1: Future Work - Question System Quick Concept

The amount of content could be expanded as well, spanning towards other categories of music like Art and Folk. If the information proves to be incompatible within the same map, then it could be designed as a sister experience or under an additional tab in the main page.

Measures should be put in place to prevent users from skipping genres. At the time of writing, users are able to complete as many genres as they want by just skipping text in order to get to the genre they want to see. Ideally, an intrinsically motivated user would still engage with the content at their own pace, which most participants did. But some may find this exploit to be demotivating. As such, further research is needed to find the best strategy to avert this type of user behavior while keeping restrictions at a minimum.

Some aesthetic matters can still be improved upon. Design could be made more appealing, both graphically and in a UI/UX sense. Animations can be enhanced to look more fluid and capable of more functionalities.

A community could be fostered around the platform, sharing musical content and further expanding on the available genres with trivia or highlights. Content could be added regularly keeping the platform up to date and users returning. On that note, support for other languages would also be ideal to reach a wider audience.

Content should be made easier to review when users have already completed a genre. This way it could also be used as a pseudo-encyclopedia of music. Following that train of thought, external links and references should be added to make it easier for anyone willing to explore a genre more thoroughly.

There are limitless ways to further improve on this idea and, as it stands, the possibilities are nearly endless.

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Appendix A

Entry Form

On the following pages you will find the questionnaires used for Soundventure's entry point.

Entry Form Transcript

These questions were asked on the Soundventure website with tabs containing every set of questions. Users could only proceed to the next if they had answered every required question from the previous tab. All questions are assumed to be required unless specified otherwise. Any text between square brackets is an added specification to this transcript and was not present in the actual forms.

<Tab 1>

Entry Form

Welcome to Soundventure!

Before we begin, I'd like to refer to Musicmap for all the musical information used on this website. This project would not have been possible without their work.

For more on them, visit them later at Musicmap.info

<Tab 2>

To help us understand what kind of users our platform is working with, we'd like to ask you a few things.

You may answer **in either English or Portuguese**, whichever way you feel more comfortable with.

Again, this form is confidential and as such, your identity will not be shared or published.

<Tab 3>

0.1 - What is your age?

____

0.2 - How comfortable are you with English reading?

- 1 (Not comfortable at all)
- 2
- 3
- 4
- 5 (Very comfortable)

<Tab 4>

1 - Are you familiar with music genres as a concept?

- Yes
- No

1.1 - How many do you listen to in a week on average?
[Question required if the user answered 'Yes' to question 1]

- 0
- 1
- 2
- 3 or more

1.2 - How many do you listen to in a month on average?
[Question required if the user answered 'Yes' to question 1]

- 0
- 1
- 2
- 3 or more

1.3 - What are your favorites?
[Question required if the user answered 'Yes' to question 1]

<Tab 3>

2 - Have you ever studied or worked with music before?

- Yes
- No

2.1 - For how long have you studied music?
[Question required if the user answered 'Yes' to question 2]

- Never
- Less than a year
- 1 to 4 years
- 5 to 7 years
- 8 years or more

2.2 - What kind of music did you study?
[Question required if the user did NOT answer ‘Never’ to question 2.1]

_____

2.3 - How have you worked with music? (choose any that apply)
[Question required if the user answered ‘Yes’ to question 2]

- Composing/Arranging
- Teaching
- Performing/Playing an instrument
- Producing/Mixing
- Other_____

<Tab 4>

3 - What platforms do you use to listen to music?

_____

3.1 - Do they help you find new music?

- Yes
- No

3.2 - If so, how do they do it? / If not, what aren't they doing right?
[First question if the answer was ‘Yes’ to question 3.1. The second one if the answer was ‘No’]

_____

3.3 - Out of that new music, would you say your options are novel and diverse?

- Yes. I often come across many different styles of music, some that I've never even heard before.
- Sometimes. Every now and again I find a style that I've never heard before.
- Rarely. Only if I search hard enough.
- No. They usually circle around styles of music I'm already familiar with.

<Tab 5>

4 - Are you familiar with gamification as a concept?

- Yes
- No

4.1 - Have you used any gamified platforms?
[Question required if the user answered ‘Yes’ to question 4]

- Yes
- No

4.2 - What were they?
[Question required if the user answered ‘Yes’ to question 4.1]

_____

4.3 - Were they helpful in motivating you to do the intended tasks?
[Question required if the user answered ‘Yes’ to question 4.1]

- Yes
- No

<Tab 6>

5 - Have you played any video games before?

- Yes
- No

5.1 - Would you say you're well acquainted to how they work?
[Question required if the user answered ‘Yes’ to question 5]

- Yes, I'm experienced and have been playing them for a while.
- Somewhat, I only play them casually.
- No, I haven't had many experiences with them.

5.2 - Have you ever played any games with dialog boxes? (example: Role-playing games (RPGs) where characters speak through text.)
[Question required if the user answered ‘Yes’ to question 5]

- Yes, several
- Yes, but very few
- No

<Tab 7>

6. (optional) Is there information that we haven't asked that you feel is relevant to mention? (If so, please leave it here)

_____
_____

Appendix B

Last Form

On the following pages you will find the questionnaires used for Soundventure's endpoint.

Last Form Transcript

These questions were asked on the Soundventure website with tabs containing every set of questions. Users could only proceed to the next if they had answered every required question from the previous tab. All questions are assumed to be required unless specified otherwise. Any text between square brackets is an added specification to this transcript and was not present in the actual forms.

<Tab 1>

Last Form
The time for testing is over!
It's time to ask questions.

Thank you for using Soundventure.
Now that the test period is over, it's time to evaluate the prototype. As such, I'll be asking you about your experience with the platform over the next few minutes.

This is a crucial part of this experiment, so I ask you to please grant some of your time. You'll be redirected to the site again once the form is complete.

Click the "Next" button once you're ready to begin.

<Tab 2>

1. Visiting the Website
Scroll down to see every question!

1.1 - Did you return to Soundventure regularly?

- Yes
- Not as much as I would have liked
- No

1.1.1 - If not, why didn't you?
[Question required if the user answered ‘No’ or ‘Not as much...’ to question 1.1]

- It didn't capture my interest.
- I didn't have the time, otherwise I would have.
- It was hard for me to understand it.
- Other: _____

1.2 - Since Soundventure is entirely in English, was that a detriment to your experience?

- Yes, I would have appreciated it more if it had a Portuguese version.
- I had a few issues, but it was still enjoyable
- No, I could understand everything just fine
- Other: _____

1.3 - If Soundventure was available on mobile, do you think you would've used it more often?

- Yes, I would've preferred to visit it on mobile.
- Yes, I would've liked the option to visit on mobile.
- No, it wouldn't have changed much.

<Tab 3>

2. Quality of the Experience
Scroll down to see every question!

2.1 - Was Soundventure an enjoyable experience?

- Yes
- Meh
- No

2.1.1 - If not, why not?
[Question required if the user answered 'No' to question 2.1]

_____

2.1.2 - (optional) What could have been done to make it more enjoyable?

_____

<Tab 4>

3. Discovery and Exploration
Scroll down to see every question!

3.1 - Did Soundventure lead you to discover new music you had not heard before?

- Yes
- No

3.1.1 - If so, are you planning on listening to some of those new genres of music more often now?
[Question required if the user answered ‘Yes’ to question 3.1]

- Yes
- No

3.2 - Did Soundventure lead you to rediscover new music you had not heard in a while?

- Yes
- No

3.2.1 - If so, are you planning on listening to some of those genres of music more often now?
[Question required if the user answered ‘Yes’ to question 3.2]

- Yes
- No

3.3 - Did Soundventure lead you to discover more about music you were already familiar with?

- Yes
- No

For this next question, we’ll be using the term “remarkable music” as music that stands out to you or is memorable in some way, be it for positive reasons or negative reasons.

3.4 - Did Soundventure lead you to discover remarkable music?

- Yes, both positively and negatively remarkable music.
- Yes, but only positively remarkable music.
- Yes, but only negatively remarkable music.
- No, it was all quite unremarkable.

3.4.1 - Would you say that there is value in discovering negatively remarkable music?

- Yes
- No

<Tab 5>

4. Choices and Structure
Scroll down to see every question!

4.1 - Would you say that the method of sequentially unlocking music genres was an effective way to explore music?

- Yes
- No

4.2 - If every genre was unlocked from the start, would it have made a more effective method than the one previously mentioned? (You can use Musicmap.info as a reference. It may help you compare their method to Soundventure's)

- Yes, it would have been more effective.
- It would have been the same.
- No, it wouldn't have been as effective.

4.2.1 - (optional) If you'd like, please leave any other observations you may have found after comparing Soundventure to MusicMap on the field below:

_____

4.3 - In this platform, genres were linked through their primary musical, historical and cultural influences. Was that connection clear?

- Yes
- No

4.4 - These links were also used as paths to unlock and reach new genres. Was this strategy effective in providing a coherent progression through the musical genres?

- Yes
- No

4.5 - Did you use the Clef Key to unlock any genres?

- Yes, all the time.
- Yes, once or twice.
- No, not at all.

4.5.1 - Would you say the Clef Key was an essential part of the platform?

- Yes, it plays an important role.
- No, but it's a nice option to have.
- No, I don't think it's needed.
- No, and it would have been better off without it.

4.6 - Did you, at any point of your experience with the platform, feel overwhelmed by the amount of available choices?

- Yes
- No

4.6.1 - If so, when did that happen?
[Question required if the user answered 'Yes' to question 4.6]

_____

<Tab 6>

5. Friend System

5.1 - Did you add any friends to Soundventure?

- Yes
- No

5.1.1 - If not, why not?
[Question required if the user answered 'No' to question 5.1]

- No one else I knew was using the platform.
- I didn't see a reason to.
- I didn't know that was an option.
- Other:_____

5.2 - Did the Friend System enhance your experience?
[Question required if the user answered 'Yes' to question 5.1]

- Yes, having friends there made it more enjoyable.
- No, it would have been pretty much the same without it.
- No, it would have been better if it wasn't there.

5.3 - Did you set any favorites?
[Question required if the user answered ‘Yes’ to question 5.1]

- Yes
- No
- I didn't know that was possible

5.4 - Did you use the recommendation system?
[Question required if the user answered ‘Yes’ to question 5.1]

- Yes, both for sending and checking recommendations.
- Yes, but only for sending recommendations.
- Yes, but only for checking recommendations
- No, I didn't use it
- No, I didn't know I could use it.

5.5 - Did you find any new or remarkable music through recommendations or friend favorites?
[Question required if the user answered ‘Yes’ to question 5.1]

- Yes
- No

5.6 - Did any recommendations or friend favorites stir up interest in a genre that you wouldn’t otherwise seek out?
[Question required if the user answered ‘Yes’ to question 5.1]

- Yes
- No

<Tab 7>

6. Story-based Gamification
Scroll down to see every question!

6.1 - Does the introductory sequence enhance the experience? (Introduction to the platform and “G” -> Exploring a familiar genre -> Introduction to the story premise -> Accessing the map)

- Yes, it's an important introduction to the platform.
- No, it didn't make a difference.
- No, I'd rather skip to the map at the beginning.
- Other:_____

6.2 - Does the introductory narrative enhance the experience? (i.e. the premise where “G” downloads the internet and relies on you to put the map back together)

- Yes, I felt more involved.
- No, it didn’t make a difference.
- No, I’d rather not have it.
- Other:_____

6.3 - Does G help make the platform more engaging?

- Yes
- No

6.4 - Is G an intrusive character?

- Yes, they negatively impact my experience frequently.
- Yes, sometimes.
- No, I’ve never even considered that.

<Tab 8>

7. Real World Impact
Scroll down to see every question!

7.1 - Did Soundventure change how you used to see certain genres of music?

- Yes
- No

7.2 - Did Soundventure entice you to search for new music (i.e. that you wouldn’t have otherwise) on other platforms?

- Yes
- No

7.3 - Did Soundventure entice you to learn more, on other platforms, about the origins and influences of any of the music genres?

- Yes
- No

<Tab 9>

8. Future Work
Scroll down to see every question!

8.1 - Would you continue to use the platform?

- Yes
- No

8.1.1A - If so, what for? (choose any that may apply)
[Question required if the user answered 'Yes' to question 8.1]

- To continue completing the map
- To use as a reference
- To review any information I've learned so far.
- Other:_____

8.1.1B - If not, why not?
[Question required if the user answered 'No' to question 8.1]

- I didn't like it
- I've had enough fun already.
- I've completed the map, so I feel like I've done everything it has to offer.
- Other_____

8.2 - What changes/features would you add to the platform in order to improve it?

_____

8.3 - (Optional) What other notes and feedback would you like to give us?
_____
_____
_____

<Tab 10>

Thank you for your answers!
I hope you've been enjoying Soundventure

[Picture of G smiling]

Come back to explore anytime!

-Miguel

Appendix C

Previous Soundventure Iteration

On the following pages you will find screenshots of the previous iteration of Soundventure developed alongside André Sousa and Guilherme Lima.

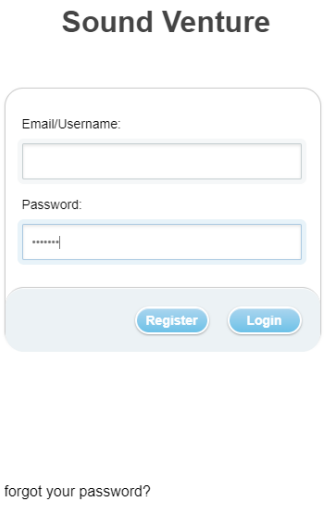


Figure C.1: Previous Iteration - Login Page

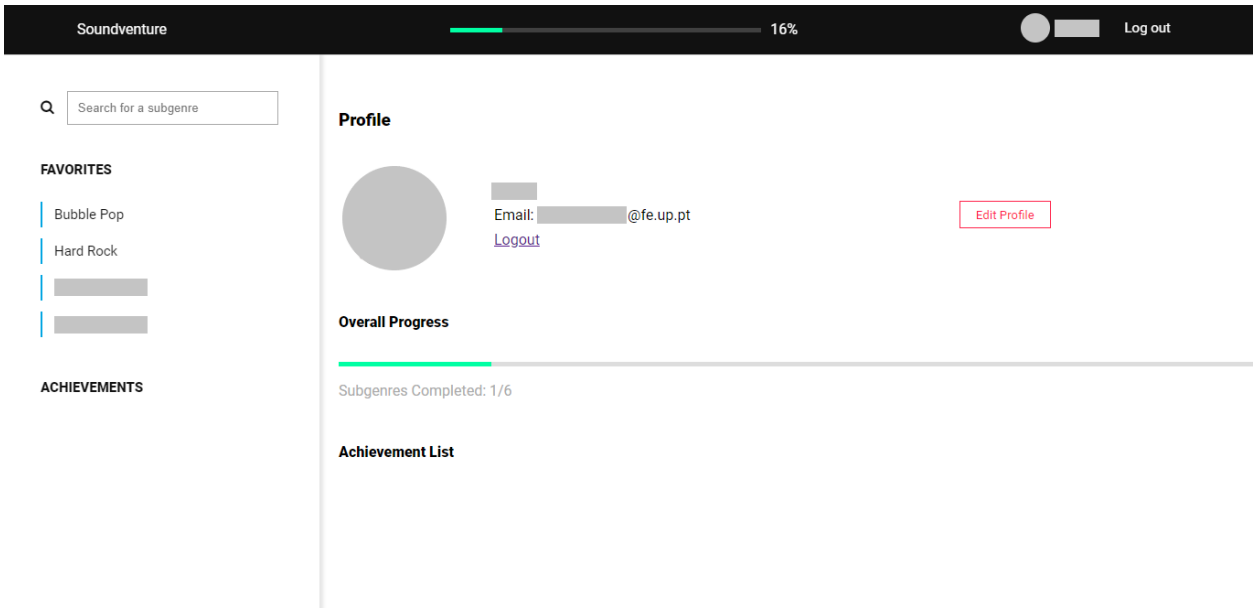


Figure C.2: Previous Iteration - Profile Page

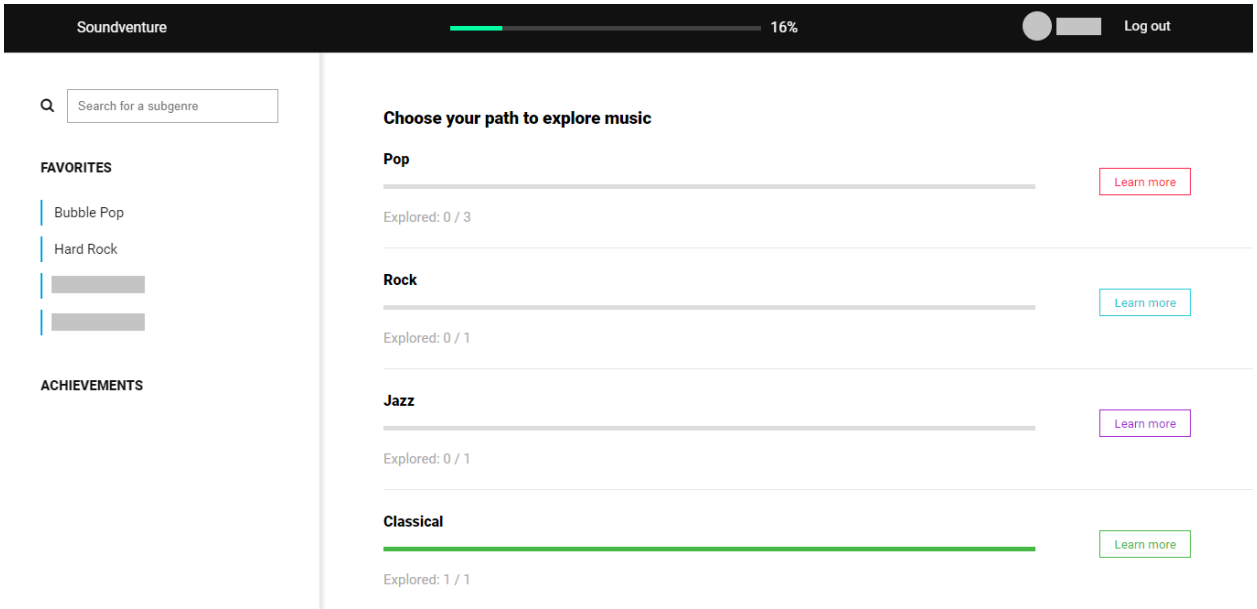


Figure C.3: Previous Iteration - Dashboard

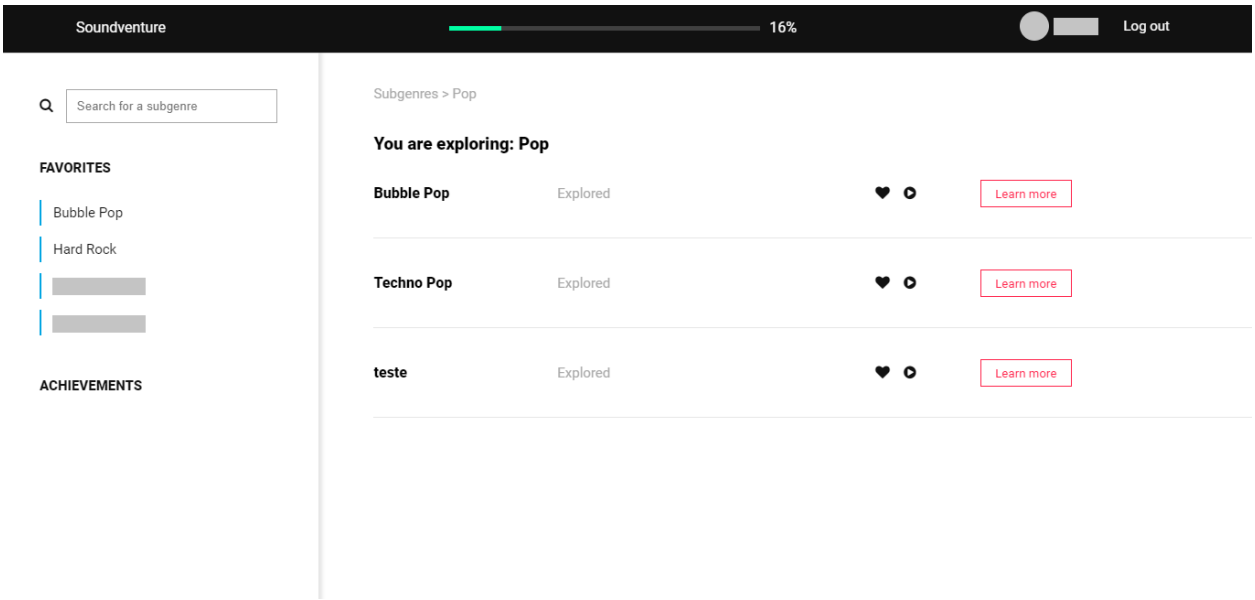


Figure C.4: Previous Iteration - Supergenre Page

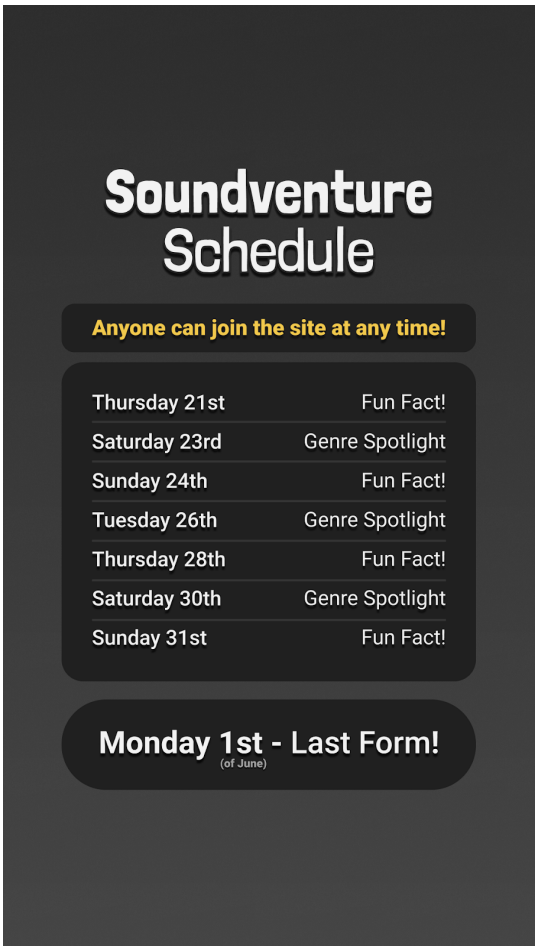
Appendix D

Social Media Content

Posts made on social media to promote the platform can be found on the following pages. For more information, visit the Instagram or Facebook page.

Social Media Posts

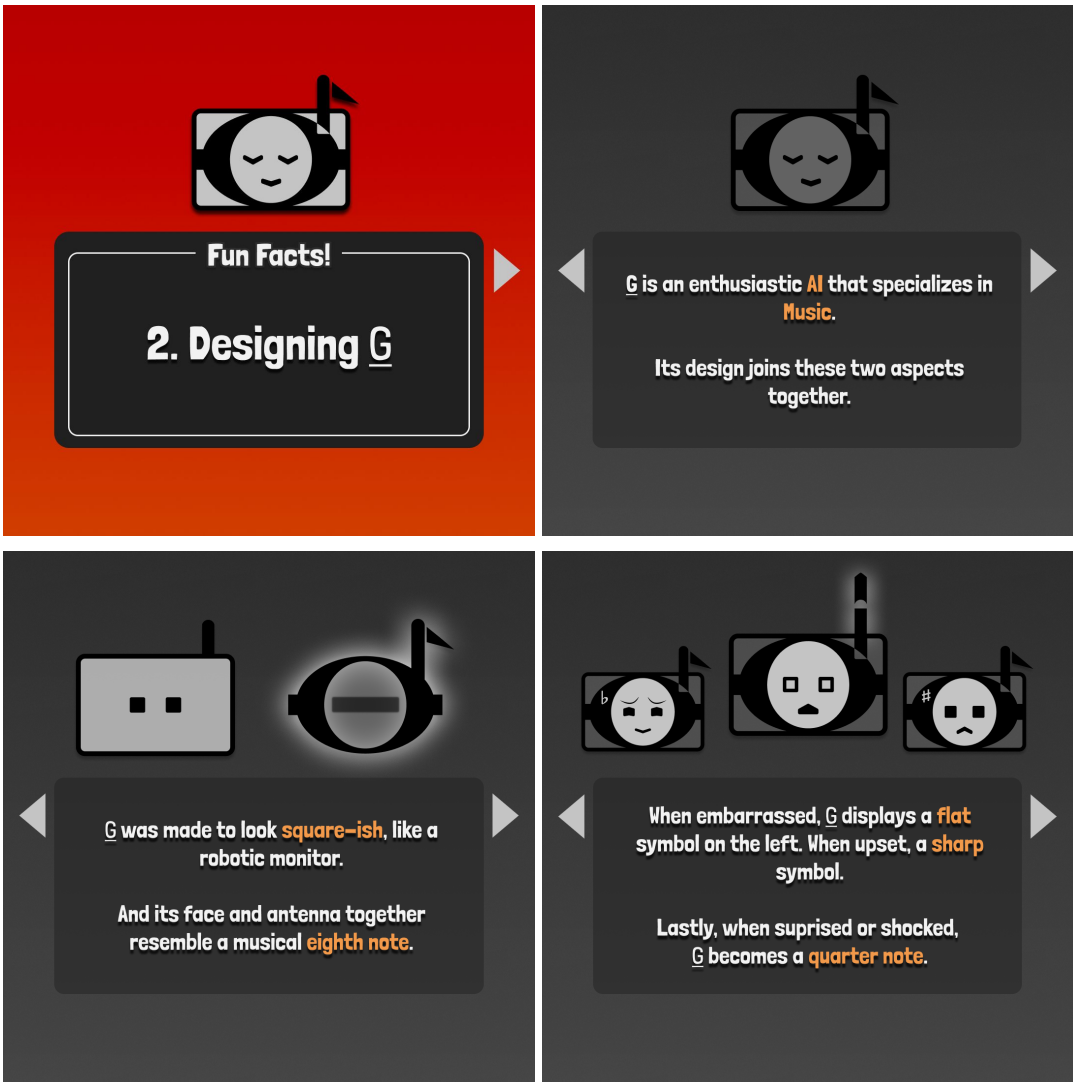
Schedule



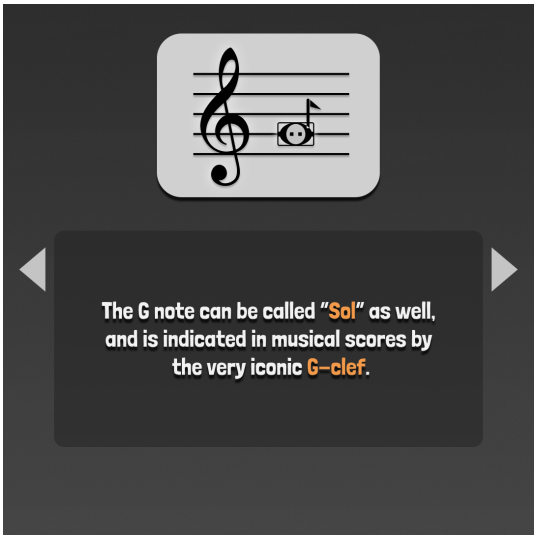
Fun Facts! #1 (6 images)



Fun Facts #2 (7 images)



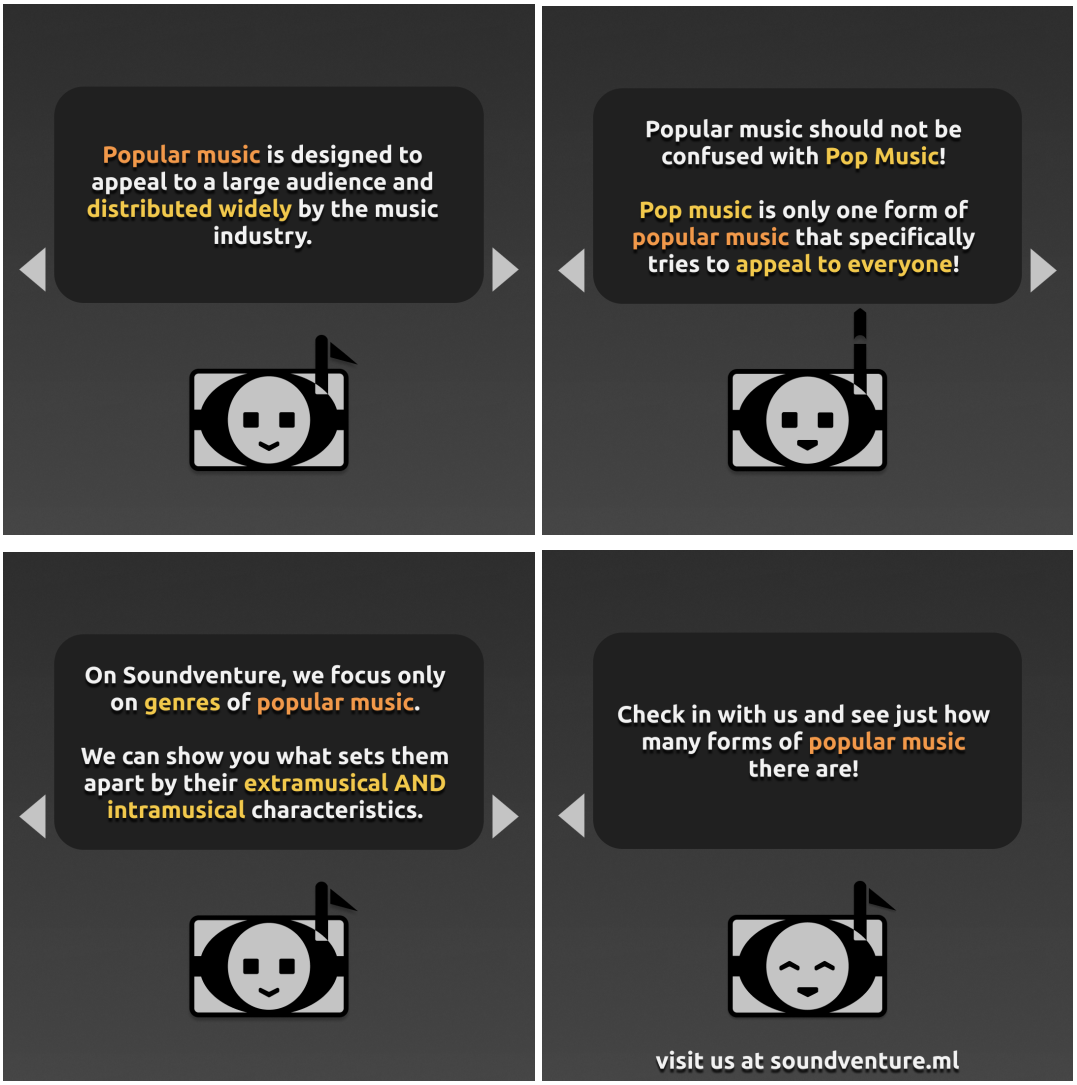

G's name is short for GENREBOT, which is its full designation.
But it's also one of the seven letters used to name musical notes!
(C, D, E, F, G, A, B)


The G note can be called "Sol" as well, and is indicated in musical scores by the very iconic G-clef.

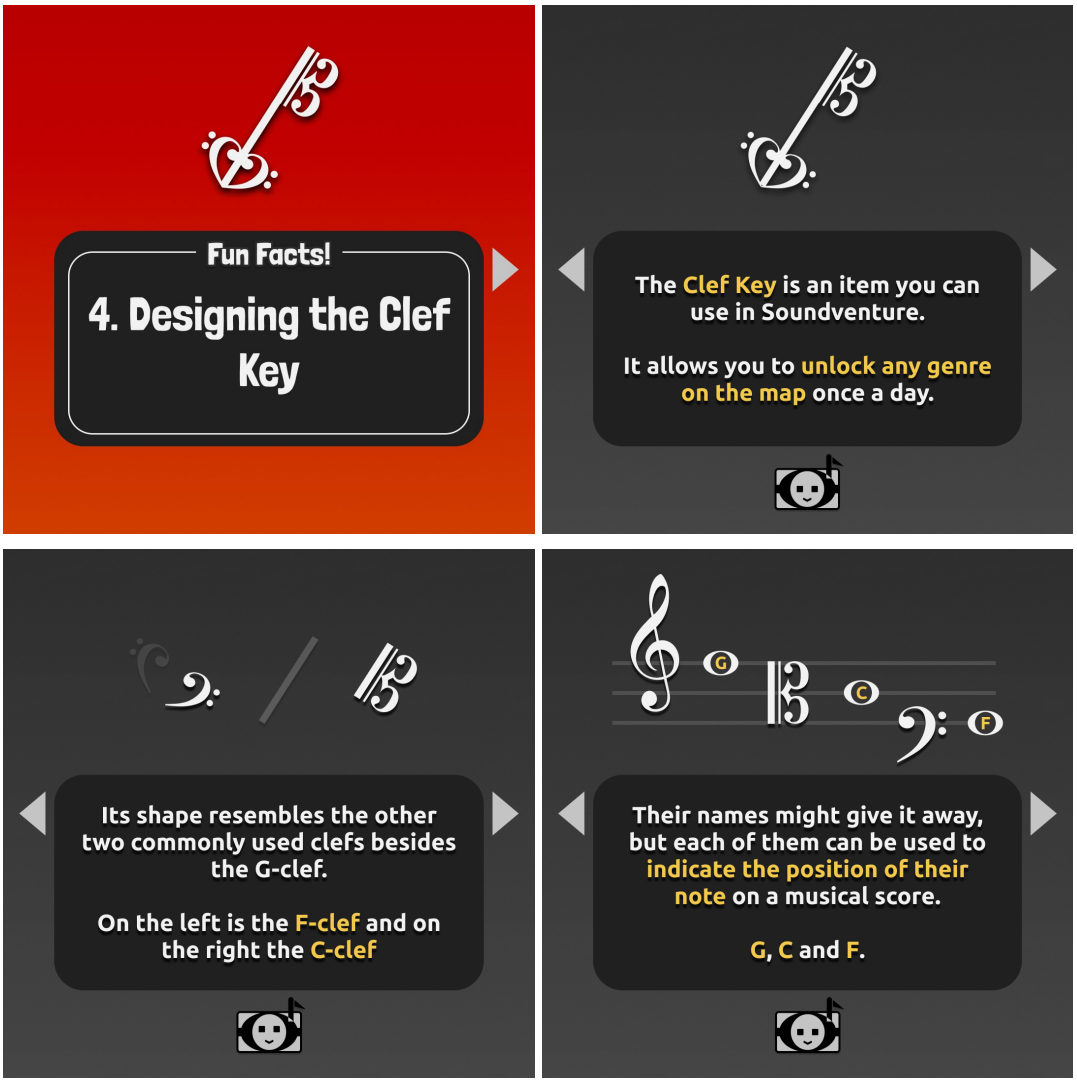

Soundventure
G's Presentation
I spoke in G notes back on the demo video too.
...does anyone else feel like the letter "G" has no meaning anymore after reading it so many times...?
soundventure.ml

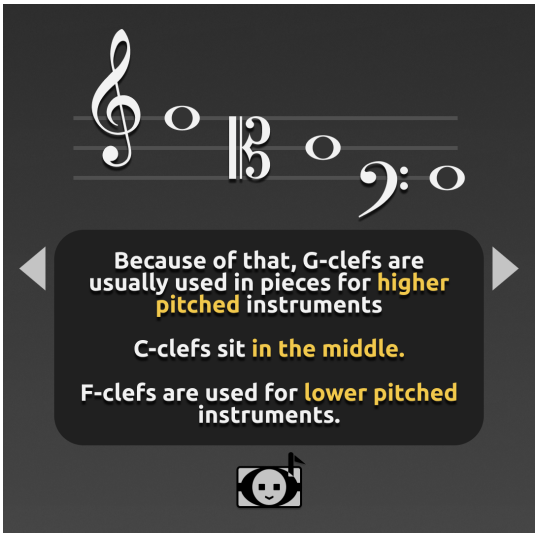
Fun Facts #3 (10 images)

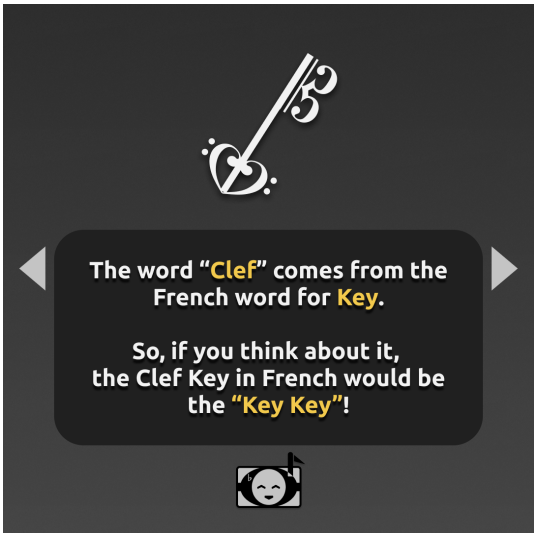


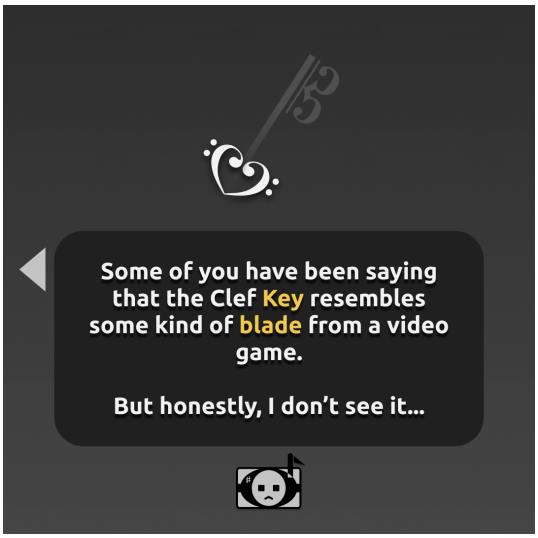

Popular music is designed to appeal to a large audience and distributed widely by the music industry.
Popular music should not be confused with Pop Music!
Pop music is only one form of popular music that specifically tries to appeal to everyone!
On Soundventure, we focus only on genres of popular music.
We can show you what sets them apart by their extramusical AND intramusical characteristics.
Check in with us and see just how many forms of popular music there are!
visit us at soundventure.ml

Fun Facts #4 (7 images)




Because of that, G-clefs are usually used in pieces for higher pitched instruments
C-clefs sit in the middle.
F-clefs are used for lower pitched instruments.

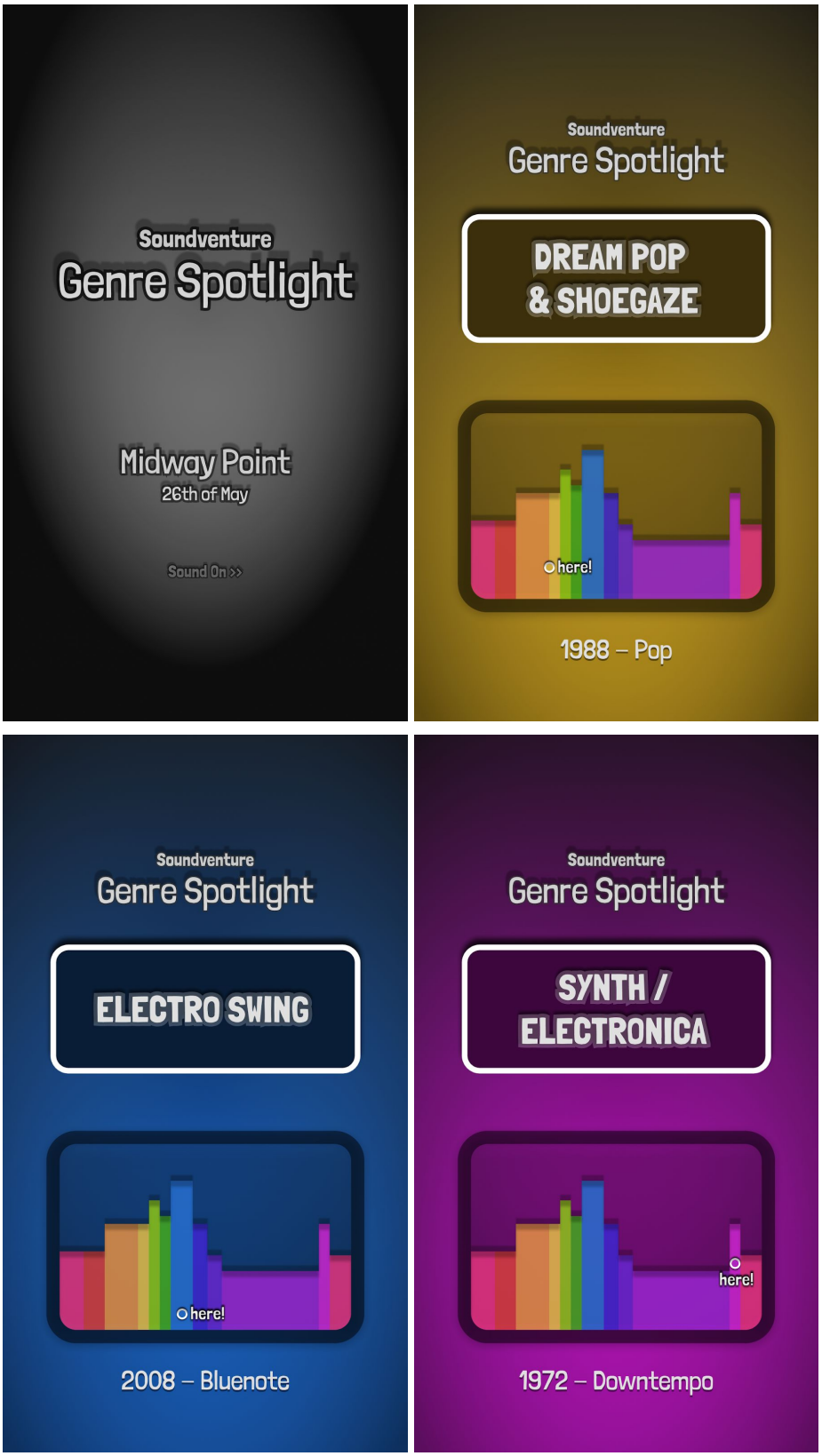

The word "Clef" comes from the French word for Key.
So, if you think about it, the Clef Key in French would be the "Key Key"!


Some of you have been saying that the Clef Key resembles some kind of blade from a video game.
But honestly, I don't see it...

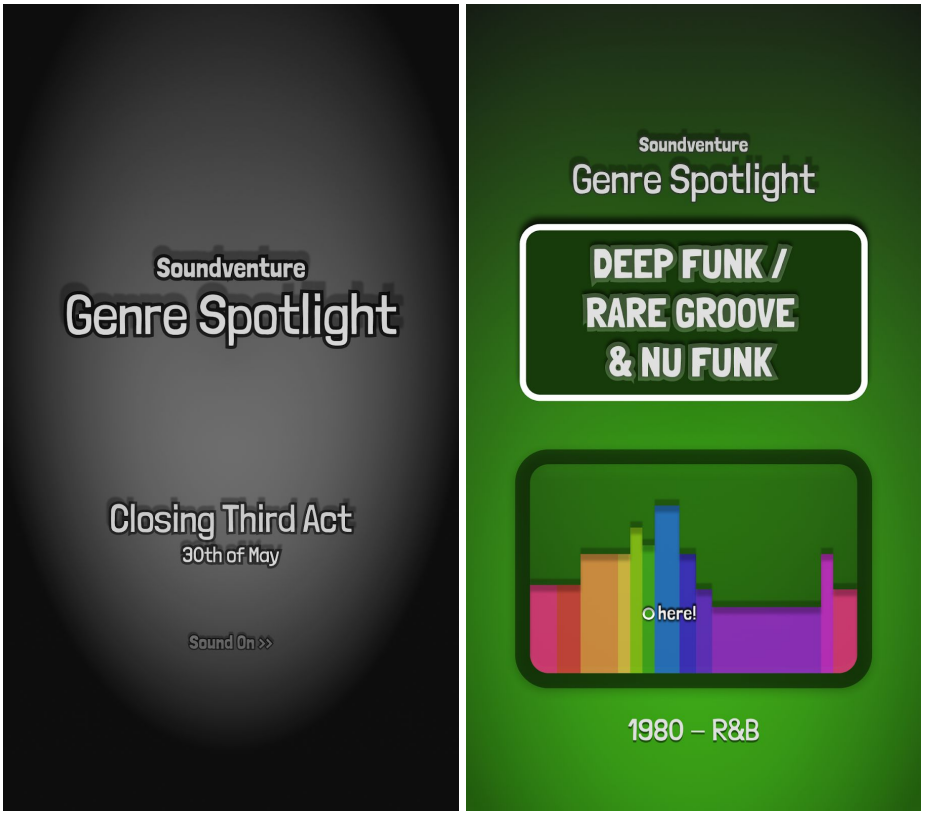
Genre Spotlight #1 (4 stories)

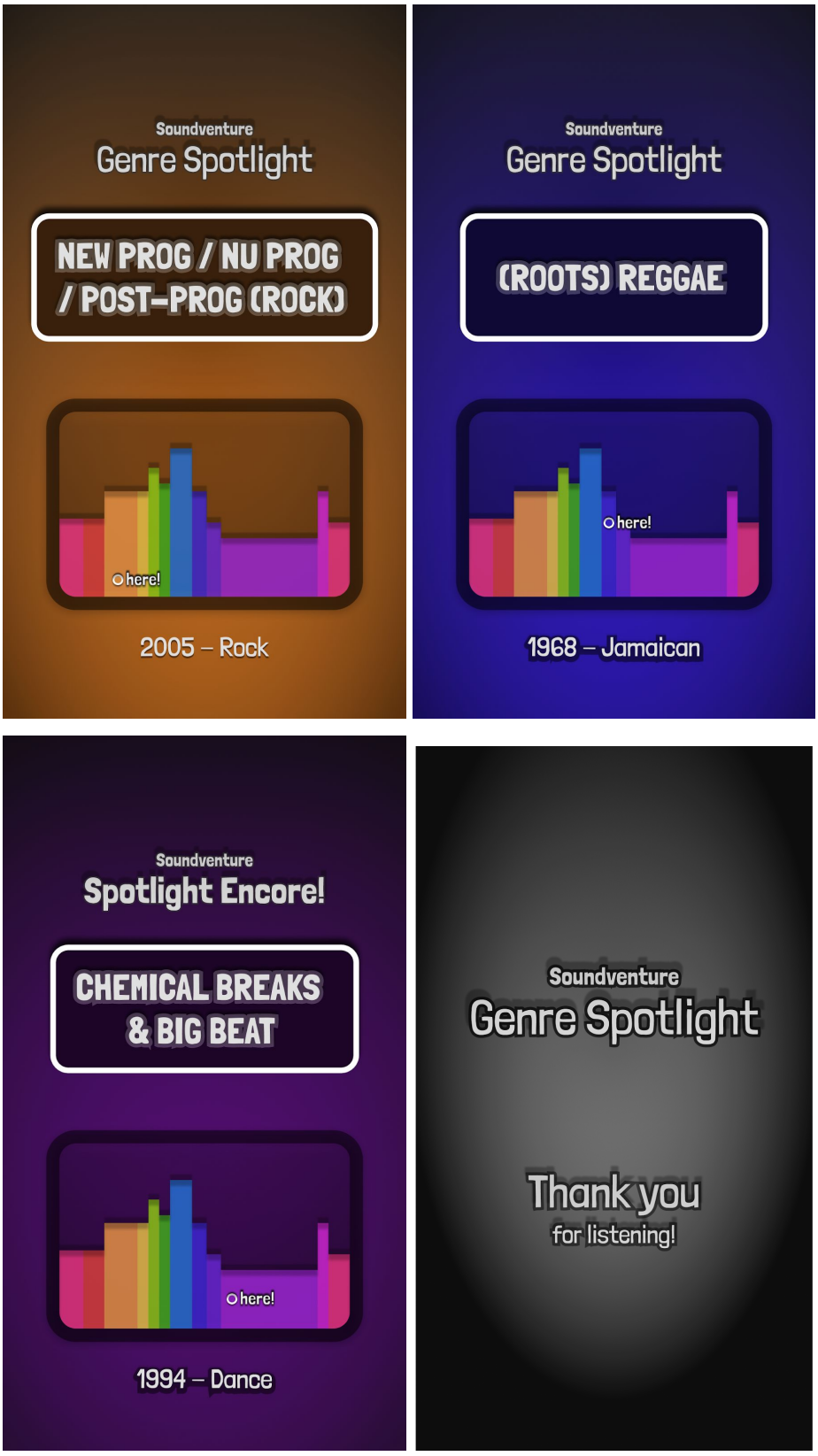


Genre Spotlight #2 (4 stories)



Genre Spotlight #3 (6 stories)




Soundventure
Genre Spotlight
NEW PROG / NU PROG / POST-PROG (ROCK)
here!
2005 – Rock
Soundventure
Genre Spotlight
(ROOTS) REGGAE
here!
1968 – Jamaican
Soundventure
Spotlight Encore!
CHEMICAL BREAKS & BIG BEAT
here!
1994 – Dance
Soundventure
Genre Spotlight
Thank you
for listening!

Appendix E

Registration Disclaimer

A transcript of the disclaimer shown to users on Soundventure's registration page can be seen on the following page.

Disclaimer Transcript

Before you begin

Soundventure, in its current form, is a prototype designed by **Miguel Duarte** as part of an academic experiment.

As such, we ask you to please read the following information before deciding to participate:

———

This study aims to ascertain whether a gamified interface can be an effective vehicle for musical exploration.

The Soundventure experiment will occur between the 18th and 30th of May 2020, after which the data collection phase will cease.

As a participant, you will be asked to answer **two different forms**:

- The **entry form**, at the start of the experiment,
- The **last form**, after the two week test period is over.

You may return to the platform as many times as you like.

Any information you provide will be confidential. Which means that, while we are able to access it, anything that may identify you will not be made public at any point.

Keep in mind, however, that the **username** you choose can be visible to other participants and that we may use your **email** to contact you further on the matter of this study (i.e. sending you the last form mentioned before).

To proceed with the experiment, please close this message and fill out the register form on this page.