



Title: Spotify Report



Author: Diogo Andrade 89265
Daniel Pinto 89341
João Dias 89236
Rodrigo Oliveira 90514

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1. Summary / Abstract

The main purpose of this assignment is to promote a reflection and a detailed analysis around one Internet service, so we decided to choose Spotify. One would expect it to be fairly easy to talk about a popular service like Spotify, since it has become so famous, that even if you've never used it, you probably know people who have or you're minimally aware of what it consists of.

Furthermore, we'll explore more relevant topics such as: what is Spotify, its business model, social, economic and ethical impact and much more.

2. Framework

Information and communication technologies have undergone considerable changes during the last decades and have become very important in our way of life. The habits of people have changed. The way people live, socialize, learn, work and entertain, the way enterprises work and do business, the way governments govern, the priorities of international bodies have all changed.

3. What is Spotify?

Spotify is the most popular digital music, podcast, and audio streaming service in the world. It gives you access to millions of songs and content from a lot of artists, launched publicly in Europe in 2008 and expanded to most markets, including one of the largest markets, the United States. [1] [2] [3]

Your software is available across a range of devices and has basic functions, totally free, like playing music, but you can access much more if you upgrade to Spotify Premium.

With Spotify Premium, new features will be added:

- Search what you want to listen.
- Get personalized recommendations.
- Make collections of music.
- See what other people are listening to.
- Create your own Radio stations.



4. How do you think that it works?

Diogo's opinion:

"In my opinion, Spotify works like any other streaming platform. First you need to visit the Spotify website and register, then you need to choose a subscription level, and in the end, you download and install the Spotify application."

Daniel's opinion:

"As a non-Spotify user, my view on the platform is very generic. It's a free streaming platform with the option of paid premium subscriptions that offer perks. Among those perks, there's the possibility of using the platform without advertisements."

Rodrigo's opinion:

"For the longest time, I assumed that Spotify made most of their money off of ads but expected subscriptions to be more significant to the overall scheme of Spotify's profits. As for the streaming, I read somewhere that the audio came encrypted in order to prevent illegal downloads. The price has always seemed fair for me, but I had never bought Spotify Premium before coming to University, where I'm eligible for the student discount."

João's opinion:

"Spotify is a multibillion-dollar company that offers a platform that allows users to stream music, just like any other streaming service, and profits from user's subscriptions and advertisements."



5. Targeted audience

The target audience that uses Spotify are millennials, representing 72% of users. Statistics report that 26% of Spotify users range between the ages of 18 to 24 and 29% are of age 25 to 34. [4]

As Spotify users are able to make their playlists public, and people can follow each other's playlists, it makes the music culture very interconnected. It also divides people into very specific groups because each playlist usually consists of a certain type or genre of songs. [5] [6]

Comment from a Spotify user:

"Spotify accomplishes their goal of greater audience appeal as it doesn't sell music, it sells access to it... We have gone from a world of scarcity to one of abundance. Nothing is for sale because everything is available... Spotify enables members of society to step out of their comfort zone and try something new, without having to pay a price for taking the risk. This leads to new discoveries about musicians and about us, and transforms the music industry into a freer, more unpredictable world with endless possibilities." [7]

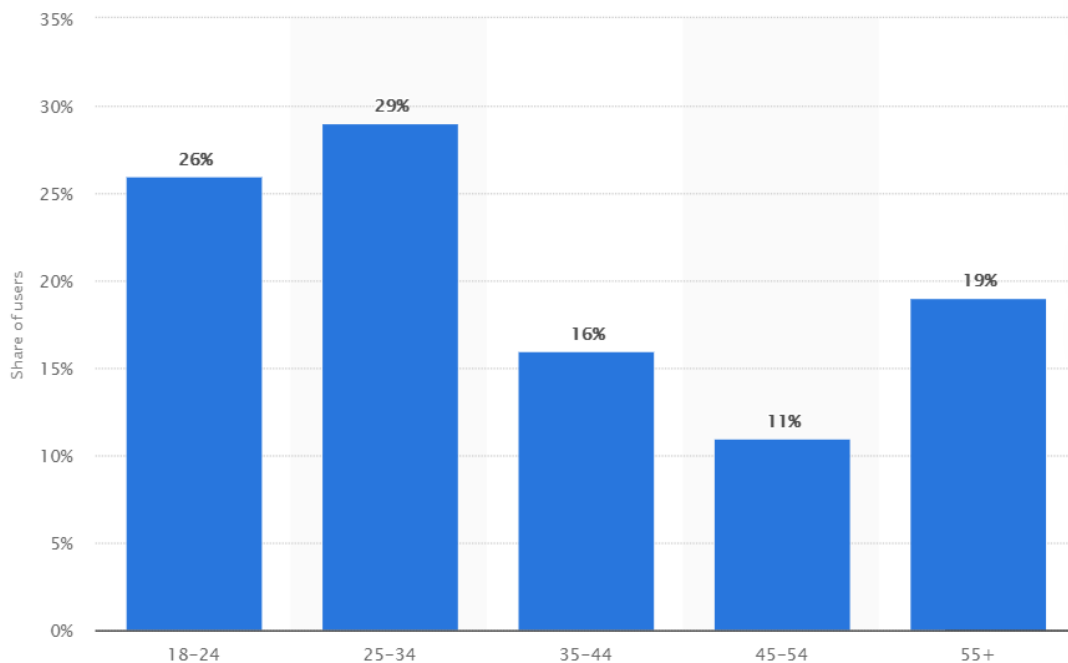


Figure 1: Number of users by age



6. Business Model

6.1 *How does Spotify make money?*

When we first launch the app in our phone or desktop we are greeted right away with ads. Even though they're so predominant in the app, they're not the main revenue generator. That title goes to the subscriptions. Spotify follows a Freemium model, that, in other words, means that users are allowed to freely use the app, but have the option to pay and get some extra features. Spotify has 4 plans [8] on offer in Portugal at the moment: [9] [10]

- The **free version** that gives you unlimited ad-supported streaming, shuffle-only playback of songs on mobile and access to podcast and videos;
- The **premium individual version** for 6.99 EUR/month and 1 month free, offers streaming ad-free, support for extreme (320 kbps) quality soundtracks, offline listening and on-demand playback;
- the **premium family version** for 10.99 EUR/month and 1 month free, offers 6 premium accounts for family members living under one roof, a family mix, able to block explicit music and also has ad-free streaming, support for extreme (320 kbps) quality soundtracks, offline play and on-demand playback;
- The **premium student version** for 3.49 EUR/month offers everything the individual version offered but cheaper for university students;

Spotify creates a habit in the users to use on-demand access on the web and takes this feature away from them on mobile. Add ads to the mix and it pushes the user to pay for the premium version. You can drive down the cost of the subscription by up to 75% by subscribing as a family. Even if you only use 2 accounts, this gives you a 25% cost reduction.



6.2 Advertisements

Spotify uses the following types of ads: [11]

- **Branded Moments:** Remind users of a brand at a specific moment. Brands can choose a specific moment in which the user can watch an ad of their company and get 30 minutes of uninterrupted music;
- **Sponsored Sessions:** Similar to the Branded one, but it makes users click the display in order to get the 30-minute listening session;
- **Audio:** Clickable banner accompanied with music;
- **Video Takeover:** A full focus video ad that guarantees user attention;
- **Overlay:** Full-page image ad that appears when Spotify is opened after being minimized;
- **Homepage Takeover:** Full-width banner on the home screen;
- **Sponsored Playlist:** The ad replaces the playlist image for the duration of the playlist;
- **Leaderboard:** A 30 second clickable banner ad.

Spotify makes **91%** of its revenue from subscriptions and the other **9%** from advertisements. Out of the revenue it generates, Spotify keeps **30%** and splits the remaining amount between licensing, music deals and paying the artists. The way Spotify pays artists is simple. They take all of the money generated from the users and put it in a big pot. That pot is then divided by the total share of streams each artist received. Let's imagine you were a premium user and only listened to *Taylor Swift*. If Spotify gave 100 million euros of their revenues to artists in a month and *Taylor Swift* songs accounted 1% of all streams, she would receive **1 million euros**. Following this model, only **1%** of your money is going to *Taylor Swift*, even though 100% of the time you spend on Spotify is listening to Taylor, almost all of your money is going to somebody else. [12]

This has attracted significant criticism since its 2008 launch. Multiple artists have criticized the policy, most notably *Thom Yorke* and *Taylor Swift*, who temporarily withdrew their music from the service. We'll discuss this more along with the ethics and morality involved in the **section 5**.

6.3 Barely any profit

Even though they have 271 million users, 124 million of which are premium users, Spotify isn't known for its profit. Actually, quite the opposite. From its beginning in 2008 up until the beginning of 2019 profit was something the company was never able to achieve, and even other giant competitors like Apple Music and Amazon struggled with the same problem. Even though these companies are generating well over \$1 billion in annual revenue from advertises and subscriptions, both are far from profitable. An analysis made a couple of years ago, published by Generator Research, concluded that the streaming business, in its current state, was "inherently unprofitable" and that "no current music subscription service...can ever be profitable, even if they execute perfectly."

Despite all of this, in the first quarter of 2019, Spotify was able to generate profit for the first time and continued to do so for the following quarters of the year. Even though, according to experts, this profit is not going to last, it is a big accomplishment not only for Spotify but for the music industry as well.

With that being said, until they figure out how they can profit consistently, their future will always be in question, but, for now, investors see enough potential to fund them. [13]

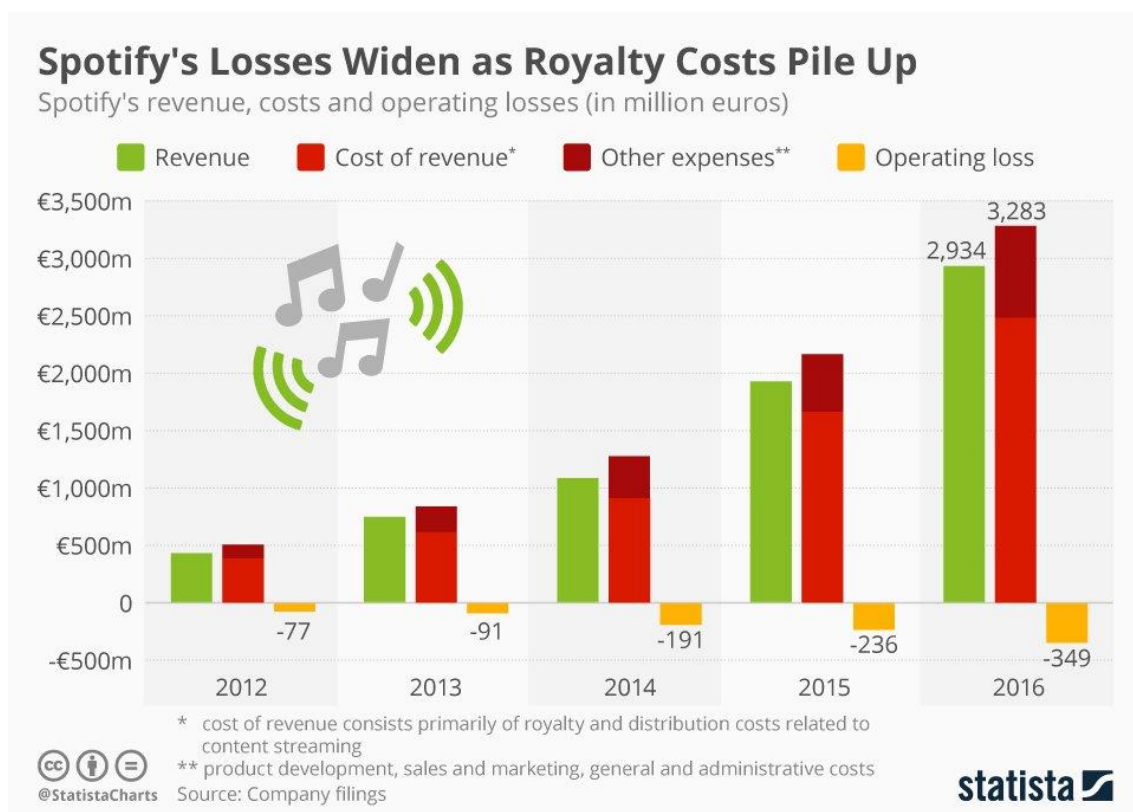


Figure 2: Spotify's Losses Widen as Royalty Costs Pile Up



7. Social, Economic and Ethical

With the rise of music streaming services popularity, buying mp3 files has become very unusual, let alone buying CD's or vinyl records. Using services like Spotify is far more convenient and economical if we look at the quantity of music we can listen to.

Apart from economic benefits, the appearance of streaming services has reduced the numbers of music piracy. This because, being both convenient and free, music streaming services offer a legal alternative where users don't have to worry about downloading a file that might not even be an audio file.

Overall, services like Spotify offer exactly what listeners want, but the same cannot be applied entirely when we talk about the artists that make the platform what it is. [14] [15]

As explained before, Spotify makes its revenue from subscriptions and advertisement, from which it keeps 30% and uses the remaining for licensing, music deals and for paying artists. Music deals cover a lot of the remaining revenue leaving only 1% for the artists. The way that 1% is split through the artists has long been criticized and raises the question if it's the correct and most ethical way to pay artists.

It has even led to the exit of artists from the platform, such as Taylor Swift. In an interview with Time's magazine, Taylor Swift states:

"I didn't see that happening, perception-wise, when I put my music on Spotify. Everybody's complaining about how music sales are shrinking, but nobody's changing the way they're doing things. They keep running towards streaming, which is, for the most part, what has been shrinking the numbers of paid album sales." [16]

But how exactly does Spotify pay the artists and why is it so criticized? To understand it let's think in the following scenario:

Marcus is a premium Spotify user. Recently he found a less known artist that he really enjoys and spent an entire month listening to his music.

Given that Marcus has a paid subscription and spent the entire month listening to that artist, he could assume that a fair share of the money from his subscription would be redirected to the artist in question. But that is not the case.

Spotify pays artists according to the number of plays they got in a track, which not everyone likes. A lot of people would prefer a more user centered paying method, where part of an user subscription money would be split through the artists according to the number of streams dedicated to them by the user.

A payment method likes these values a lot more the user preference which is highly desirable by the community. However, a model like this would carry a lot more



costs and time. Even though it's a more ethical model, if adopted, Spotify would need to keep track of every user streams in a database in order to split the money correctly through artists. Such model would be more expensive to maintain, heavier computationally and could even lead to less paying amounts to artists which contradicts the objective of a user centered model. [12] [17]

8. Algorithm

Spotify is constantly doing everything it can to get people to listen to more music. To accomplish that, the company has created algorithms to control everything, from the user's personal home screen to the curated playlists, the main one being **Discover Weekly**. Automated music recommendations are hardly new, but Spotify seems to have identified the ingredients to a personalized playlist that feels unique, new and familiar at the same time. These ingredients fall into the three types of recommendation models. [18]

8.1 Recommendation Models

In order for the Discover Weekly to be so effective, it implements three types of recommendation models, the collaborative **Filtering Model**, the **Natural Language Processing Model**, and the **Audio Model**. [19]

The **Filtering Model** is a method that was first popularized by Netflix, but unlike Netflix, Spotify doesn't use a star rating in its music, it does instead use the stream counts and other additional data of the track to filter its music. For example, if the user has saved the track in a playlist or visited the respective artist's page after hearing his music, data about this is saved and used for future recommendations, not only for the user itself, but most importantly, for other users. In the images below we can see how users that share interests can influence each other.

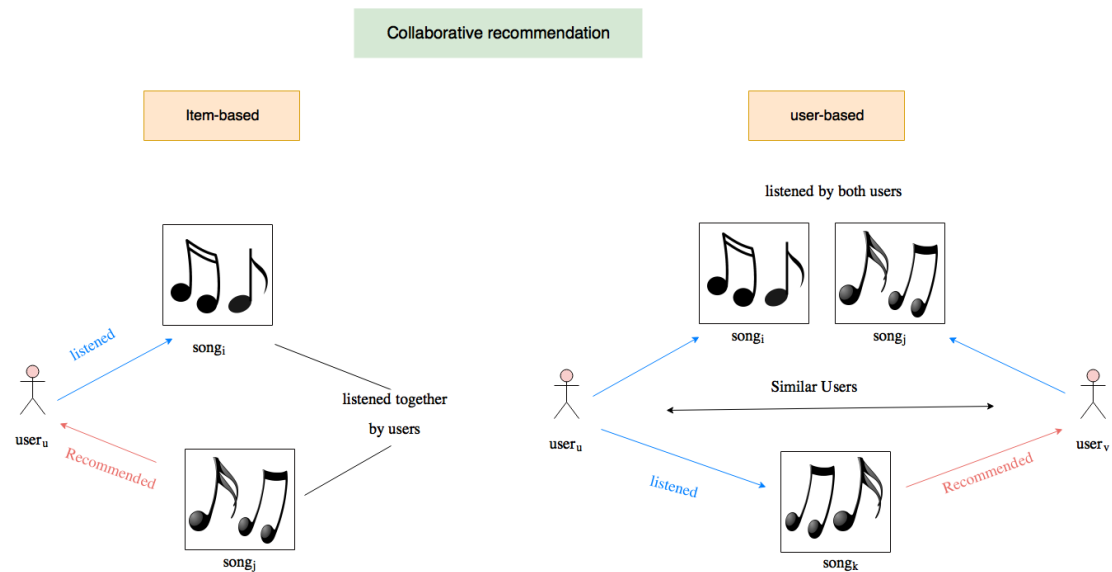


Figure 3: How Collaborative recommendation works

$$\begin{matrix} \text{Users} \end{matrix} \begin{pmatrix} 1 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \end{pmatrix} \approx \underbrace{\begin{pmatrix} x \\ x \\ x \end{pmatrix}}_{\text{user vector}} \underbrace{\begin{pmatrix} x \\ x \\ x \end{pmatrix}}_{\text{song vector}} f$$

Songs

Figure 4: Matrix of the equation that's behind the Collaborative model



The **Natural Language Processing Model** is a subfield of linguistics, computer science, information engineering and artificial intelligence concerned with the interactions between computers and human languages [20]. It focuses on how to analyze large amounts of natural language data. Each song/artist is associated with a set of different terms that change every day, each of these terms has a value that changes depending on how frequently those appear online, meaning that the frequency of times a specific artist or song is talked about online can greatly influence the music that is recommended to you. Just like *Brian Whitman*, a former Spotify worker, said:

“the quantity of conversation is used to inform our “hottnesss” and familiarity data points, representing how popular the artist is now on the internet and overall how well known they might be.”

The **Audio Model** is the one that brings balance to the platform, as we’ve seen before, both of the other models had a great influence on popularity and influence of the artist on the recommendations. The **Audio Model** on the other hand doesn’t care about any of that and focuses only on raw audio data. It might sound weird how a computer is able to decide what music should be recommended, but this analysis does play a major role in the recommendations Spotify offers. Users don’t expect a playlist to jump around and fluctuate too much, for example, quiet and calm songs should not be followed by loud metal music. Another example, for jogging, the tempo should steadily increase, kind of like the heartbeat. These small details do really make a big difference when it comes down to making a new playlist. What Spotify does with this model is that it takes any audio file, outputs both low-level and high-level information for any song in the world, and with this, it is able to compare several songs and link them together.

While competitors like Apple Music, Amazon Prime Music and Google music rely on a mix of paid humans and community-created playlists, Spotify’s main differentiating factor is the level of customization and expansion of music knowledge offered to customers and all the artificial intelligence that goes behind their suggestions. [21]

“The company makes it clear in research that the success of all these algorithmic services is only possible because every action you make on the service is tracked and logged.” – Matthew Ogle [22]

Like referenced before, these recommendations come with a cost, they have to track every action you make in order to gather information and even though many are against it, it’s the only way systems like the Discover Weekly are able to be so successful.



9. Spotify effects on infrastructures and entities upon which it depends

Spotify uses three different bitrates: the higher the bitrate, the better the quality of the songs. But, the higher the quality, the higher the bandwidth usage will be too. These are the three bitrates used by Spotify:

- **96 kbps**: this is the default quality for its mobile apps;
- **160 kbps**: used on the desktop app and on the web player; or used on mobile when you choose the “high quality” option;
- **320 kbps**: the highest bitrate offered and only offered to Premium members. Available on mobile too as the “extreme quality” option.

	96 kbps	160 kbps	320 kbps
Mobile app (Android, iOS)	Standard	High Quality	Extreme Quality
Web player	X	Standard	High Quality
Desktop player	X	Standard	High Quality

Figure 5: Quality option associated to a bitrate in every device

Data Consumption	96 kbps	160 kbps	320 kbps
Per minute	0.72 MB	1.2 MB	2.4 MB
Per hour	43.2 MB	72.0 MB	144.0 MB
Time per GB	23h 8m	13h 53m	6h 57m

Figure 6: Spotify data consumption

[23]



10. How does it compare to other similar services? [24]

10.1 Deezer

Deezer was founded in 2007 in France, initially as Blogmusik, a website that allowed you to search for MP3 files and play them in streaming mode. After facing copyright and other legal issues, the whole service was made legal and relaunched as Deezer after an agreement was reached with the French artist rights authority [25]. The business model was changed and the owners would then start paying the copyright holders using a share of the **revenue they got from ads and iTunes affiliate links** to buy the song, of which they got a percentage of the sale price.

After **struggling to stay afloat because of the copyright fees**, Deezer achieved an \$8.4 million investment from a private equity group and **focused on further monetizing their service** and increasing their userbase in order to eventually become self-sustainable.

In 2009 they rolled out a 3-tier subscription system, which after, with a partnership with French telecommunications company Orange in mid-2010, allowed them to reach a number of 100.000 subscribed members.

These days Deezer has 6 different subscription tiers, which include a free tier with ads, limited song skips and lower sound bitrate. The service was, as of February 2018, available in 189 countries and had 9 million paying subscribers. [26]

10.2 Tidal

Tidal was launched in 2014 by the Norwegian company Aspiro, but was later acquired by **famous hip-hop artist Jay-Z**. Its main appeal was a combination of **lossless audio** and HD video streaming with **exclusive content** from certain artists.

In March 2015, after acquiring Aspiro, Jay-Z (and by association his wife Beyoncé) launched a **mass-marketing campaign** which saw many prominent artists change their social media presence in a mysterious manner (changing their profile design to blue and posting the hashtag “#TIDALforAll” on several social media platforms. At the end of that month, a **press conference** was held by Jay-Z and **15 other artists** who were announced as **co-owners and stakeholders** in the streaming service. Tidal was then being promoted as the first artist-owned streaming service.

The main driving idea behind Tidal was to **hand the “control” of the music business back to the artists** by having them own the service their content is provided by. The list of 15 artists was impressive (Jay-Z, [Beyoncé](#), [Rihanna](#), [Kanye West](#), [Nicki Minaj](#), [Daft Punk](#), [Jack White](#), [Madonna](#), [Arcade Fire](#), [Alicia Keys](#), [Usher](#), [Chris Martin](#),



[Calvin Harris](#), [deadmau5](#), [Jason Aldean](#) and [J. Cole](#)) and some would say that these were amongst **the top 1% of artists worldwide**, which gave their claims and Tidal itself more traction in this launch campaign.

After the press conference, Tidal claimed to have gained 100.000 new subscribers to the service but the upwards trend was quick to slow down. **Reception to the launch was mixed**, with many claiming that the campaign was **out-of-touch** with the current reality of the music industry, the prices were too high or that it was just too much of a **niche market** to ever manage to dent the userbase of the other major services (most notably Spotify).

The promotion of lossless audio as a main feature implies that your target audience needs to have “audiophile” grade hardware to consume this content in its desired form, which was labeled as “stupid” because this kind of hardware is either not attainable or regarded as frivolous purchases by most users. The 20€ monthly subscription cost was also a huge source of criticism.

In the end, these factors just formed a general opinion among the public that these artists thought that by making their content exclusive to this platform would drive people to subscribe *en masse*, but in the end it was just seen as **too greedy and ambitious**, which in some cases ended up **promoting piracy** because as the price was such a hurdle for most people, when Kanye West initially released his album “The Life of Pablo” as a Tidal exclusive, most people just ended up pirating it from illegal sources with West later making the album available to other competing services.

Tidal has no free subscription tier but has since lowered the subscription price of their 320kbps streaming tier to 10€, with discounted plans for families, students and members of the military. The same tiers can be found for the lossless audio streaming option, with the standard one being priced at 20€. Obviously, none of these have ads or limited listening time.

As of September 2019, Tidal operates in 54 countries, and as of May 2019, their user count was around 3 million. [27]

10.3 Apple and Google

Unsurprisingly, **Apple** and **Google** also have their own music streaming services, taking advantage of having control over the two most used mobile device platforms, **iOS** and **Android** respectively, which allows them to push their services in a seamless fashion, including them with the devices that run their platforms, but they both can be used on the “opposing” operating system.



10.3.1 Google Play Music

Google launched **Google Play Music** in late 2011, as part of its Google Play service suite. This service could be described as a **cloud storage solution for music**, as the standard service allows users to upload up to **50.000 songs** to their accounts. The service scans the user's local collection of songs and matches it against Google's library, then allowing the user to either stream in 320kbps or download the song if available. Any other songs that aren't found in Google's library are uploaded to the account's storage. So, the service positions itself as a **hassle-free way of syncing music libraries across devices**, allowing users to mix music streaming with local files.

With a Premium account, users are granted immediate on-demand streaming and offline playback of Google's 40 million song library with no ads or limited track skips. Users also get access to YouTube Premium in some countries.

Up to 5 smartphones, and up to 10 devices (including tablets and PCs), can have access to the library, but listening is limited to only one device at a time.

The service is available in 63 countries and its standard tier costs 7€ per month, positioning itself alongside Spotify cost wise. [28]

10.3.2 Apple Music

Apple Music joined the fray in June 2015, providing a very similar service to Google Play Music because of its **iCloud integration**, which combines the user's iTunes library with their Apple Music library all in one place. Besides that, it's quite similar to Spotify, with a big emphasis on **curated playlists** according to the user's musical tastes and the radio feature.

Oddly enough, Steve Jobs was known to be opposed to the idea of music subscription services but Apple ended up creating the service in 2015, taking advantage of their already huge userbase, who were already used to spending money purchasing songs on iTunes, so for a lot of them, **the idea of an iTunes integrated streaming service was very appealing**.

In 6 months, this quickly materialized in a huge success, as Apple Music reached **10 million paying subscribers**. In comparison, it took Spotify **six years** to reach this number, once again showcasing Apple's incredible control over the digital music market. In July 2018, the service **surpassed Spotify** in paying customers in the United States.

This service of course didn't come without the usual Apple **controversies**. As much as the company convenes a clean and transparent image across their line of products, it has been found to take part in less than legal business practices many times.



Before releasing the service, Apple informed artists that they **would not be paying artists** during a user's **three-month free trial**, which led to Taylor Swift releasing an open letter publicly criticizing Apple for their decision and announcing she would be holding her album "1989" from being available on the service. This, along with added pressure from other parties, forced Apple to go back on their decision and pay the artists during that period just one day after Taylor Swift released the letter.

Allegedly, it is also claimed that Apple tried to entice record labels to **withhold their content** from the "free with ads" services like Spotify in order to drive consumers towards Apple Music and also tried to get the *Universal Music Group* to pull their content from YouTube.

Even after Tidal tried (and failed) to use **exclusive content** to entice users to make the jump between services, that didn't stop Apple from trying the same practices, which ended up **creating a war** between artists and record labels because most contracts were signed between the streaming services and either the artists or the labels, not both. UMG ended up reportedly banning their artists from publishing content exclusively to any services. Spotify's stance throughout has been that **exclusivity gets in the way of growth of the music business** and that they would not endeavor into it ever. [29]

10.4 Sound Cloud

On the same month Spotify was launched, also hailing from Sweden, **SoundCloud** was launched too. This service is radically different to most of the ones mentioned previously. It was designed initially as a platform to share recordings between artists, but it quickly transformed itself into a recognized platform to publish music and gain recognition. Back then **Myspace** was still the main hub for self-promotion for artists but SoundCloud (and YouTube) quickly began to steal that spot from it.

The **growth in user count was massive** for the service in the first 4 years of its existence, but in 2012 the website made some changes that brought it closer to being a **social network for music**, putting everyone in equal footing and beginning a race to get as many followers as possible in an attempt to gain recognition, which caused some negative reactions from paying users who felt like the website didn't respect the "established" artists on the platform and were chasing an ever bigger userbase and traffic. Despite this, the service reached 40 million users in 2013.

Soon the website started facing **legal issues**. Due to how easy it was to share music on the website, with early on the rate of uploads being around 10 hours of content per minute, it was becoming increasingly difficult to control the **surge of copyrighted**



content onto the platform which led to the major labels growing increasingly impatient with SoundCloud's **inability to control these illegal uploads**. Similar problems were faced by Google due for the same reasons, but with YouTube videos being the problem instead.

From 2014 onwards, despite the platform's popularity, financial and legal issues became a usual occurrence for the website. Between attempting to boost the website's revenue, achieving a deal with an investor or dealing with legalities with major labels, the website was racing to **raise as much money as possible**. There were rumors that Twitter was interested in purchasing the service in 2015 but the inability to secure deals with labels was cited as a deal breaker. Then, in September 2016, Spotify came calling but ended up giving up too in December of the same year.

In Spring 2017 the financial issues finally became big enough to endanger the continuation of SoundCloud as a business, after failing to raise enough money to support the platform. The company lost valuation, closed offices in San Francisco and London and laid off 173 employees.

Despite, for the most part, not having any sort of copyrighted content available on their base platform from major labels, SoundCloud still has a dedicated user base and remains a big player for artists looking for recognition (once again, alongside YouTube) and is **supported by ads and their subscription services**. SoundCloud Pro allows artists to upload more music and obtain enhanced analytics. The other subscription service is SoundCloud Go which gives users the usual perks: no ads, offline playback of songs, and *finally* have access to select content from major labels, albeit with a smaller library than other big players like Spotify. It has two tiers, one with and another without the access to the major label content, priced at 10 and 5 dollars respectively.

What started as probably the **purest and most (smaller) artist friendly** music streaming service, ended up becoming a **confusing mess** of policies, monetization and controversial changes, which were inevitable once the platform reached unbearable levels of pressure from major labels in 2014 and failed to either pass the hot potato to a bigger company by selling it or to establish in black and white what they were aiming to achieve with their service, leading to it now both **not being recognized as a major streaming service** and **having fallen massively behind** other social media websites for music promotion for smaller artists. [30]



11. Conclusions

In conclusion, this project was crucial for us to have a bigger insight on what goes on “behind the scenes” of such a well-known company. The members of the group who have never used Spotify obviously learned a lot about it and are now able to make a fair judgment on the service. Surprisingly, the ones who have actually used it, found many particularities they had never heard of before, and things they initially thought they knew but were wrong about. Some of the things we did not have answers for were mostly related to the company’s business model and the essential mechanisms and processes that are associated with the service. The morality that goes into such things was also a surprise, alongside the details of their profit, which isn’t as favorable as one would expect.

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