

Disrupting the Disrupters: Algorithmic Inequality in Music Streaming

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Introduction

At the time of writing, the world is submerged in a global health pandemic, which has kept individuals in lockdown in their homes for months at a time. This has increased individuals' dependency on the internet to carry out tasks that range from working and studying at home, to entertainment and communication. Early analysis by Forbes indicates a 50-70% increase in the use of the internet, with an increase of at least 12% in the use of streaming services (Beech, 2020).

The internet has become an undeniably pervasive feature of our lives, even before lockdown. The advent of internet services has significantly changed a variety of industries, making former businesses obsolete and bringing about “creative destruction”, or the “dismantling of long-standing practices” through innovation (Kopp, 2019). This destruction is not always for the best, as it brings with it a host of new problems, including the loss of jobs and the uneven distribution of wealth. This essay will analyse the case of a particular industry- music, analysing the music streaming giant Spotify and its role in transforming the music industry. It will describe some of the negative externalities of the platform, identified through primary and secondary research. It will then present a proposal for a plugin, “Remora”, that has the potential to transform Spotify, generating a more transparent browsing experience.

The Music Industry

The music industry has undergone significant transformations over time, shaped strongly by the available technology at any given moment, and most recently by the internet and its capacity to disseminate music in a variety of ways. The economic and cultural systems around music have evolved as technology has found ways to capture and share live performance- transferring ownership from the author or artist to the producer of the copies or the owner of the means of distribution.

Artists in the 20th century relied on record labels and distributors to get their music to audiences, sacrificing a large part of the revenue generated in exchange (McDonald, 2019). Though copies of music (such as cassettes or CDs) expanded artists' reach beyond their geographic location, it concentrated the power in the hands of distributors. In the late 20th century, record labels and distributor were a kind of gatekeeper between artists and audiences, amassing most of the wealth in the industry. **"The industry had control of technology...and therefore the people were subservient to that technology"** (Krukowski, 2019, p.76).

The industry was transformed with the advent of the internet in the 1990s, and the introduction of peer to peer sharing of digital music and illegal downloading. Record labels waged a digital battle against this phenomenon, famously causing the shutdown of the prominent illegal music downloading platform Napster (Klodnicki, 2014). Legal options for downloading music emerged soon thereafter, spearheaded by Apple's iTunes in 2001. Online music eliminated "the traditional promotion and distribution bottlenecks inherent in terrestrial radio and traditional music retailing" (Aguar and Waldfogel, 2018, p1), disrupting the market. Disruption is a process by which a "smaller company with fewer resources is able to successfully challenge established incumbent businesses" (Christensen, Raynor, McDonald, 2015), or in this case, an entire market. As digital music rose, "sales of vinyl records, cassette tapes, and CDs...plummeted", causing the music industry to lose "billions of dollars" (McDonald 2019).

In 2006, the industry was transformed again by the creation of the music streaming platform Spotify, a Swedish platform that offered a library of close to 50 million tracks to be played on demand, legally. Since then, it has amassed the greatest number of subscribers worldwide (Iqbal, 2020). This disruptive business model has since been adopted by a handful of innovators since, including Apple Music and Tidal, who together with Spotify, have come to dominate the market. By 2018, streaming platforms accounted for 46.9% of music revenue. **Streaming platforms became the new gatekeepers of music, mediating the relationship between artists and listeners in a new way.**

To this day, Spotify alone accounts for 286 million monthly active users (Iqbal, 2020). Despite its great popularity, there is controversy around Spotify's model and questions around whether it has democratized the music space. The following section will analyse Spotify's model, drawing parallels with other internet platforms and questioning the economic model that they collectively propagate.

Internet Giants

“Disruption’ by the use of digital network technology undermines the very idea of markets and capitalism. Instead of economics being about a bunch of players with unique positions in a market, we devolve toward a small number of spying operations in omniscient positions, which means that eventually markets of all kinds will shrink.”

(Lanier, 2013 p. 60)

Spotify controls 36% of the global streaming market, which in turn controls around half of the music market (Iqbal, 2020). In offline business, this market share would be enough to raise concerns over monopolisation. Yet, on the internet, it is a common instance, with examples of “online platforms that have come to dominate, or nearly dominate, their respective markets in search advertising (Google), social networking (Facebook), online retailing (Amazon), and others” (Aguar and Waldfogel, 2018, p2).

These quasi-monopolistic giants were once considered “disruptors” in each of their fields, addressing the pain points of pre-internet industries. **They offer users low prices or even apparently free products, with reduced friction and an almost global presence- but at what cost?**

Lanier points out that “online services are bringing bargains to everyone, and yet wealth disparity is increasing while social mobility is decreasing” (2013, p.60). The internet giants have grown disproportionately and disqualified smaller players, partly thanks to inequality of information. Streaming platforms, for example, have the ability to collect data on users and leverage it to attract and retain more users. As they gain users and expand across locations, they accumulate great amounts of data that overpower the “local information-access advantages” that small businesses used to leverage (Lanier, 2013, p.137-138).

The growth of internet giants has been to the advantage of a very small number of people. Internet age companies such as Facebook employ a surprisingly small number of people, in proportion to its users (Lanier, 2013, p.52). The reason is that most of the content that is offered by these giants (music, in the case of Spotify) is created by individuals outside of the organisation, that often go unremunerated. These platforms “channel much of the productivity of ordinary people into an informal economy of barter and reputation, while concentrating the extracted old-fashioned wealth for themselves” (Lanier, 2013, p.51-52).

The large and ever-growing market share of the internet giants creates what Lanier calls a “winner-take-all” distribution of wealth: a few “stars” accumulate most of the wealth, while smaller players are left with scraps (2013, p.33). Internet giants have seized the markets they disrupted, diminishing the participation and share of the rest of the players to non-existence. Based on the economic models of these giants, **Lanier predicts that digitized “economic and cultural activity will ultimately shrink the economy while concentrating wealth and power in new ways that are not sustainable” (2013, p.48).**

Spotify and Algorithms

"What's the worldview that's contained within any form of technology?"

How does that worldview include or exclude people?"

(Anderson, 2017)

Spotify's model is not based solely on the availability of music files, but also on sorting those files to recommend music to users. The service of recommending music has always had a place in the music industry- once held by DJs, radio programmes and record labels. It became all the more relevant with the advent of the internet, as the democratization of music distribution through digital channels means that there are now literally millions of audio files available. As Krukowski puts it, *"the internet gives us access to so much information, it creates a power vacuum: what will order all this data for us? What will bring a sense of hierarchy and priority to it?"* (2019, p.93).

The service of ordering data is not only present in the music industry, but is deeply ingrained in the activity of other internet giants such as search engines and sales platforms, which sort information to give users results that are relevant to them. Though this feature may seem useful, it grants the platform control over what information gets prioritised, without offering transparency about how they are making that decision.

Within Spotify and other music streaming platforms, music is ordered through algorithms, a kind of sorting process described by Anderson as "a question written in code" (2017). Algorithms are used to analyse vast amounts of data, organising them to generate a desired outcome. In the case of Spotify, algorithms determine music recommendations that will be more relevant to the user.

Spotify's algorithms use a combination of collaborative filtering, natural language processing and raw audio models (Ciocca, 2017). The first two of these algorithmic processes are based on popularity, meaning that tracks that are well-liked by other users or talked about favourably on the internet will be recommended. The third is based on musical similarity, meaning tracks that sound similar to existing tracks or genres will be favoured.

These recommendation algorithms are used to generate playlists around genres ("Acoustic Room"), moods ("Chillout Session"), labels ("Rough Trade Recommends"), eras ("80s Smash Hits") or by geographical locations (eg. "UK Top 4"). They are also used to create personalized playlists based on user tastes, such as "Made For You", or "Discover Weekly", to recommend tracks to extend existing user playlists and to determine which tracks are played automatically after a chosen track.

Though the way Spotify filters information is automated, it is still deeply subjective. *Algorithms, including those used by Spotify, "cannot be objective, because they've been designed by human beings within a specific cultural context and are shaped by specific cultural values"* (Barassi, 2019). They contain the biases of the people who programmed them, therefore generating biased outcomes (Anderson, 2017).

“Platforms can play important roles in determining song and artist success, including the determination of which songs and artists are discovered in the first place”

(Aguiar and Waldfogel, 2018, p.2)

Recommendation algorithms largely shape the browsing and listening experience of the average user. Spotify listeners spend around a third of their streaming time on “Spotify-generated playlists” (Iqbal, 2020). Such playlists are responsible for “roughly three-quarters of all the followers of the top 1,000 tracks on the platform” (Passy, 2018).

The economic impact for artists is vast: Appearing on a popular playlist, such as “Today’s Top Hits”, “raises a song’s eventual streams by almost 20 million” (Aguiar and Waldfogel, 2018, p.3). Recommendation algorithms have “substantial effects on which new artists and songs become discovered” (Aguiar and Waldfogel, 2018, p.3). Therefore, appearing on certain playlists can be “critical in raising the profile of an artist or song” (Passy, 2018).

The full impact of recommendation algorithms is difficult to gauge and creates negative externalities for both listeners and artists, which will be discussed below.

The Impact of Algorithms

"At Spotify, the dream is to provide you with music without your participation — the algorithm will know what you want."

(Krukowski, 2019, p.111)

To understand the full effect of Spotify's recommendation algorithms on artists and listeners, a team of Social Innovators and Service Designers carried out primary and secondary research during May and June 2020, including:

- ❑ **2 in-depth interviews** with local artists.
- ❑ A **Service Safari**, to understand users' experience on Spotify.
- ❑ **Online Ethnography** on a variety of internet forums, searching for people that have noticed browsing issues and denounced them. Some of the highlights from this activity can be found on p.7.

The outcomes of this research were a deep understanding of the music industry system, mapped on p.9, and some key insights around the impact of algorithms on listeners and artists, listed in the following section.

Digital Ethnography Highlights

Please stop marking shuffle complaints as "not an issue" or "implemented"

Submitted by bytebodger on 2017-07-26 02:50 AM

Below is my precise illustration of how the so-called shuffle feature is broken.

This is not a problem of people simply not understanding "true randomness". The shuffle feature will keep playing your most popular tracks first and it will keep putting the least-popular tracks near the bottom of the list. This means that you will rarely hear your least-popular tracks unless you listen to the entire playlist all the way through.



STATUS:
Not An Issue

129 VOTES

+ VOTE

↑ 30 ↓ r/spotify · Posted by u/Panny_Pollins 1 year ago

Can I shuffle all music... like all music? All of it.

I'm not sure if this exists but it would be a cool feature to shuffle random songs out of spotify's library. The whole Spotify Library

10 Comments Share Save Hide Report 88% Upvoted

This thread is archived
New comments cannot be posted and votes cannot be cast

SORT BY BEST

↑ pennytrationer 77 points · 1 year ago
↓ Guarantee you would hit shuffle and the first song from Spotify's entire library would be Drake - In my feelings

⊕ SurfaceMonkey -22 points · 1 year ago More than 1 child

↑ Jacc02 29 points · 1 year ago
↓ Doesn't matter, Spotify'll play the same 10-20 songs every time you hit play until a new batch of payola comes in.

⊖ Comment deleted by user 1 year ago 0 children

↑ 47 ↓ Posted by u/Senderoth 2 years ago

Spotify shuffle not random (Proven?)

So I found a not-well known text post by a guy on Spotify help section, proving it's not random. Apparently favors popular songs. (Link: <https://community.spotify.com/t5/Ongoing-Issues/Please-stop-marking-shuffle-complaints-as-quot-not-an-issue-quot/idi-p/1772030>)

Obviously, this affects me and lots of others on the daily. Annoying as fuck when I have TONS of songs on my playlists that I never hear, because I have 500+ songs on any of my playlists, and never will I listen through the entire list before it ends up reset, instead I just hear one of the 10 Eminem songs that sure I like, but it's annoying to hear them every damn day, multiple times a day.

My newly-chosen, purposely "unpopular" track (Carnaval de Guaranda) was never listed higher than 77th in the shuffled list. Out of 50 trials, Carnaval de Guaranda was presented, on average, at the 87th position in the shuffled list. That's not random. And that's not what most people think of when they talk about "shuffling".

↑ 351 ↓ Posted by u/s12scarper 1 year ago

Spotify needs to fix their shuffle feature

Seriously it bothers me so much. I have almost 1,000 songs saved in my library and I swear when I put one shuffle it only plays about 200 on them. Am i crazy or does anyone else fell this way?

93 Comments Share ...

90% Upvoted

Insights

"We think about music having been democratised now with streaming, but in a way it hasn't because you still have to go through these impenetrable channels to get heard by the right people, to be on Spotify playlists and all this stuff."

(Anonymous Artist, 2020)

Lack of transparency around algorithms and data use

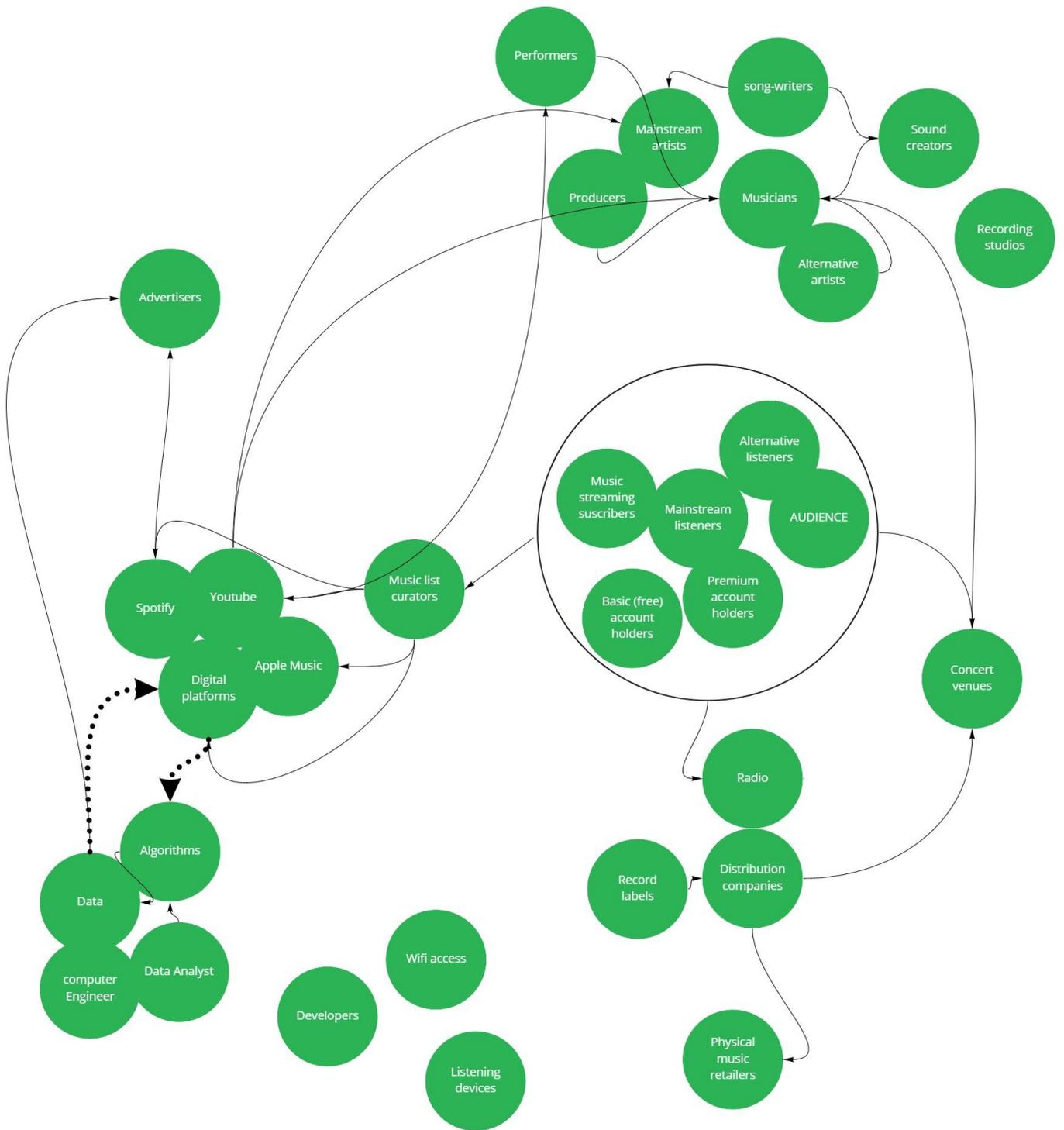
Platforms such as Spotify usually keep the algorithms they use a secret, at least to some extent, partly to avoid being copied by competitors. The problem with this is that users have no way of understanding their function and their consequences. There is also secrecy around the collection and use of data from users, such as listening behaviours, locations and other data points. Though this information is sometimes available, it is buried in the "Terms and Conditions", a short contract that users agree to before using a service, often without reading. The language of these contracts tends to be difficult to understand, including technical terms and jargon. This leads to limited understanding by users around algorithms and data.

Modifying listener tastes

Algorithmically generated playlists "have large and significant causal impacts on streaming", modifying behaviour around what artists and tracks are listened to most (Aguar and Waldfogel, 2018, p3). Recommendations make users more "conservative listeners" by guiding them to music that is similar to what they are already listening to, creating an echo-chamber (Hann, 2019).

Modifying content production

As it has become apparent that being on certain playlists can be instrumental for artists, "songwriting is now starting to contort to fit the aesthetic and audience of certain playlists" (Forde, 2017), creating uniformity in sound. Additionally, artists have started to adjust tracks to profitable formats. A song is considered "played" only after 30 seconds of streaming, leading artists to compose the first 30 seconds of their songs so they are attractive and low risk, becoming "increasingly predictable" (Hann, 2019). This has also led artists to favour the creation of multiple short tracks over long tracks, as they receive the same payment for streaming either. The result is homogenisation; artists create tracks that are increasingly similar in format and content, killing pockets of creativity and limiting creative expression.



Representation of the current music system
 (Carregha, Gentili and Moreno, 2020)

Insights

Algorithms generate unequal outcomes

Algorithmic recommendations are based partly on popularity, but analysis of their outcomes have revealed other tendencies, such as favouring artists from certain record labels, nationalities and gender. Aguiar and Waldfogel point out that “most of the benefit of the global lists accrues to US-origin major-label songs” (2018, p.3). This is no surprise, given that the “major record labels have substantial ownership stakes in Spotify”, with unknown levels of influence over recommendations (Aguiar and Waldfogel, 2018, p3). In 2018, Branchereau found that around 87% of content on Spotify originated from the “top four music labels”, raising questions about the kind of leverage that record labels have within Spotify (2018).

Algorithmic gender discrimination

A 2018 analysis of Spotify’s algorithmic generated playlists found a tendency towards male artists (Pelly). On some of Spotify’s most popular playlists, including “Today’s Top Hits” and “New Music Friday”, only around 20% of the music is made by female artists (Pelly, 2018). The year 2017 was particularly male-centred, with 100% of the top 10 most streamed albums of the year made by male artists, as well as the top 10 most streamed songs (Pelly, 2018). This tendency towards “staggeringly male-dominated” playlists raises questions about the discoverability of female artists, and whether they have equal opportunities to reach users (Pelly, 2018).

Precarisation of content production

Artists are paid shockingly low amounts, with estimates placing payment per stream between “\$0.006-0.0084 to as low as \$0.00318/stream” (Iqbal, 2020). One London-based artist we spoke to, who boasts an impressive 600,000 monthly listeners, referred to the amount she gets paid per stream as “pitiful” (Anonymous interview, 2020). The payment system is pro-rata, meaning that artists get paid according to the share of total streaming that their tracks represent, and not by absolute stream count. This means that only the artists with a large share of the total streaming pool get a decent payment, precarising the labour of all other content creators.

Unequal distribution of wealth

Spotify’s algorithms produce what Lanier calls a “star system”, with only a few winners taking most of the wealth generated from the system (2013, p.33). Popular tracks and artists get boosted by algorithms by being “featured in more playlists and becom[ing] even more popular as a result” (Daykin in Pelly, 2018). In consequence, only a handful of artists are made extremely popular, accumulating most of the wealth. As popular artists become more successful, they take a larger share of pro-rata payment, impoverishing smaller artists. In the long run, this may lead to the obliteration of these smaller artists, homogenizing the production of music further.

Remora



A plugin for Spotify that lets users see and control the data and algorithms that are shaping their music browsing experience.

In response to the ways in which Spotify is negatively impacting listeners and especially artists, this essay proposes the creation of a plugin titled “Remora”, a Spanish word for a fish that lives a symbiotic life with a shark, eating the scraps of the shark's prey. Similarly, Remora latches onto Spotify, building on the existing value, generating a new browsing experience with reduced negative impacts. Uncoincidentally, “Remora” can also be translated as *hindrance*, as its existence raises uncomfortable questions for Spotify and hinders the continuation of the status quo.

Remora would provide users transparency about how algorithms are being used to shape their browsing experience, with the option of toggling them for different browsing experience. Some of the proposed features are:

Filtering music differently

Remora would give users clarity about the algorithms that are actively shaping their browsing experience, allowing them to toggle parts of the algorithm to change that experience. They might toggle, for example, sociodemographic characteristics of artists or number of listeners, creating a browsing experience akin to affirmative action. Users would also have the option of browsing without the use of their data points, as a virtual private network, to experience filter-free browsing.

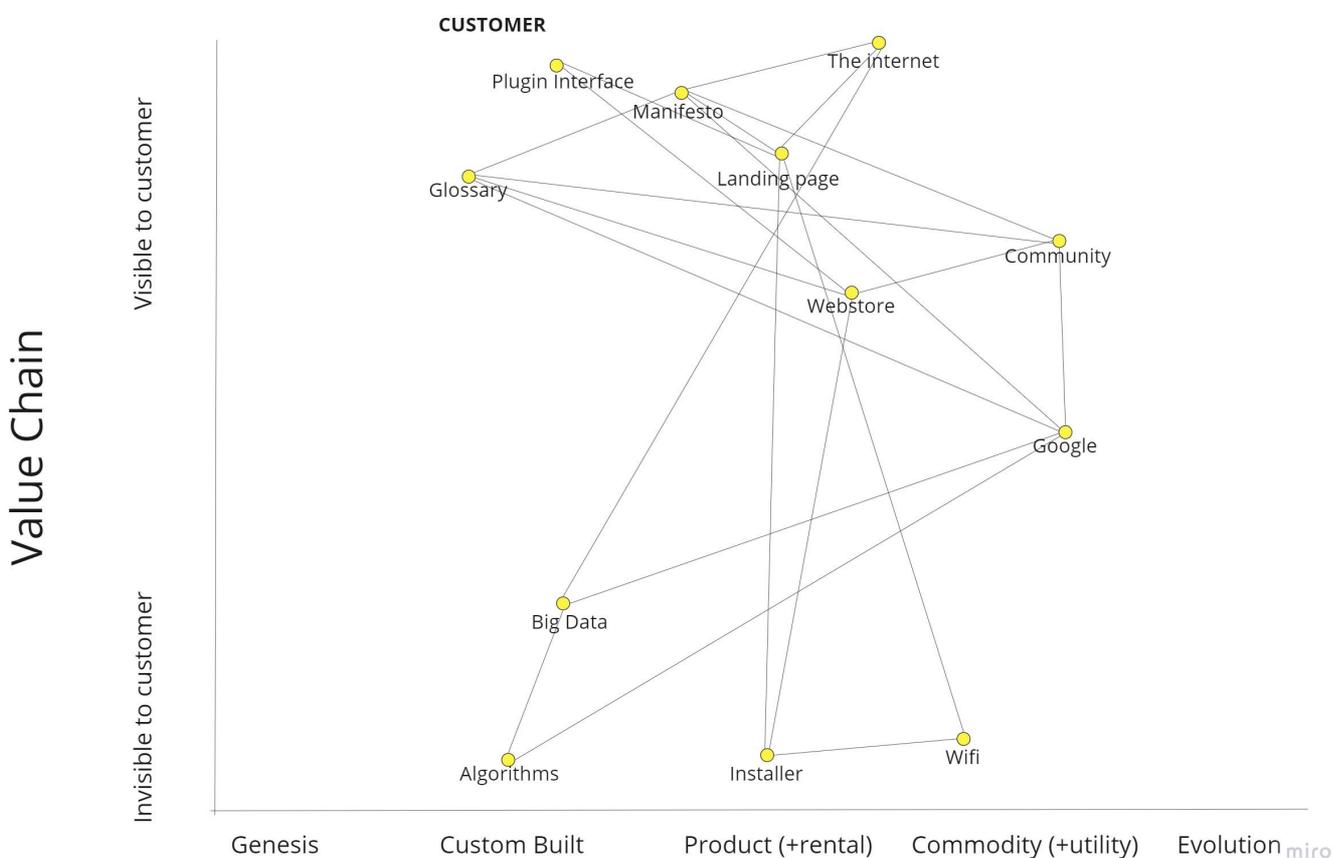
Education around algorithms and data use

Remora aims to empower users by giving them easily digestible and searchable information about algorithms and data use. The proposed features include a glossary, and a translation of Spotify's “terms and conditions” into understandable terms, making users aware of what they are consenting to and the possible implications. Additionally, Remora would regularly provide users with real examples of the negative externalities faced by artists, for example showing the low amount paid to artists after listening to an album and publishing struggling artists' testimonials.

Demanding a transparent browsing experience

Upon download of Remora, users would be prompted to sign an optional petition asking for increased transparency. Once the petition reaches an initial threshold, it would be sent to Spotify, and further on to relevant authorities. In this way, Remora is a form of protest, a way of demanding the unveiling of the algorithms used by Spotify and the negative externalities that they are generating.

The implementation of Remora relies on cross-disciplinary collaboration between developers, a legal team with knowledge of data and transparency rights, and designers to determine the strategy. Design is particularly suited to addressing the challenges of strategy, as they are able to approach complex problems with a systemic view, creating strategies that account for emergent components. Designers can use tools such as s Wardley Mapping to understand the most important components of a system by representing its relations visually (Wardley, 2018). Designers also have the ability to generate and test prototypes iteratively, as will be described in the following section.



Wardley Map (Carregha, Gentili and Madrigal, 2020)

Prototypes



The concept originated a series of prototypes, including a service blueprint (Appendix 1), several iterations of a logo and a simulated landing page within Chrome Web Store, a popular site for downloading plugins (included on p.14). These prototypes were tested in several rounds:

- ❑ In-depth testing of concept with a data specialist.
- ❑ Unstructured feedback from developers, lawyers specialising in transparency issues and music listeners.
- ❑ Testing of concept via "consequence scanning".
- ❑ Presenting the idea before a panel of students and professionals from the music industry. The pitch used for this panel can be found under Appendix 2.

Participants were presented a pitch of the idea, along with visual stimuli. They provided feedback about the concept and its possible consequences. The feedback informed further iterations of the prototypes and some modifications to the concept and how it is communicated.

Home > Extensions > Screenshot Master: Full Page Capture



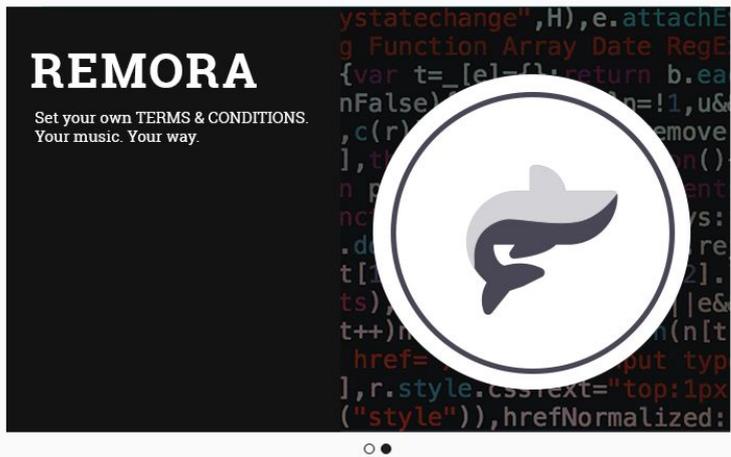
Remora: Your Music. Your way.

Offered by: Mdes Students

★★★★★ 67 | Productivity | 70,000+ users

Remove from Chrome

Overview | Reviews | Related



Overview

Compatible with your device

Our smart widget lets you set your own terms and conditions when listening to music on Spotify and other online music streaming services, such as Amazon Prime Music, Apple Music, Deezer, among others. Decide how and when your data is used, or choose to browse cookie-free.

Activate the widget when you open the online music streaming service from a Chrome window to unlock a new, transparent experience.

Advantages:

- Data transparency: Understand what specific data is being collected from your browsing and for what purposes.
- Take control of your data: Choose which of your data points are used to shape your discovery.
- Browse, cookie-free: Toggle all your data points for a cookie-free music listening experience.

Understand what artists are being actively promoted: Get full information about the artists that are spotlighted on your Spotify, including paid partnerships and sponsorships.

The data economy, decoded: Free access to our glossary, which will help you decode the terminology around online networks.

Be a data activist: downloading this widget will automatically send a letter to the Information Commissioner's Office asking for better data regulation.

Read our Manifesto

Additional Information

Report abuse

Version 1.1

Updated 22 April 2020

Size 507KiB

Languages See all 52

Developer keranipsanes@gmail.com Privacy Policy

Consequence Scanning

Prototypes were also tested using consequence scanning, a technique in which possible positive and negative outcomes of a product or service are taken into account (Doteveryone, 2019). This allows for early changes in strategy, to mitigate foreseen negative consequences and amplify positive consequences. Some of the desired consequences that were identified during this scanning are:

Increased Opportunity for Small Artists

By choosing a browsing experience that is not based on popularity, users could potentially reach artists that are currently silenced, increasing their discoverability, number of streams and revenue. This would include female and independent artists, thus preserving some of the diversity that is currently at risk.

Surge in Internet Activism

Remora aims to expose algorithmic inequality, creating awareness that browsing on any platform can have negative externalities. One of the desired outcomes is for users to question the status quo across all of the internet. Ideally, it would lead to users demanding more transparency around algorithms and the removal of algorithms that currently perpetuate inequality or discrimination. In this way, Remora is a small form of protest that could lead to larger-scale activism.

Replication

Remora helps create awareness of practices that are pervasive throughout most of the internet platforms commonly used for browsing and shopping. Similar plugins could be created to address algorithmic inequality within other platforms.

Legal Battle with Spotify

Remora may engage in a legal battle with Spotify, depending on Spotify's reaction whether or not it is considered invasive or threatening. If Remora gets taken down, this will only add to its strength, revealing Spotify as it is- a silencer, a filter. It will raise further questions around transparency and lead to the increased indignation that we are hoping to bring about.

Modelling New Behaviours

Remora will inevitably have to use algorithms to give order to data in a new way. We aim to be completely transparent about how these algorithms work and what consequences they have, offering understandable information and options to opt-in and out. This will model a new relationship between users and algorithms, providing an example of how things might work in a more democratic and transparent platform.

Conclusion

Though the full consequences of the proposed plugin cannot be known in advance, we hope that by asking questions and starting a conversation, users may become more aware of the hidden consequences of their browsing experiences. In the long term, an aggregate of these kinds of conversations could lead to a shift in the way the internet giants work, towards a more just space.



Advertisement Prototype, Moreno, 2020

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