UiA University of Agder

The Algorithmic Black Box: Exploring the Impact of Spotify and TikTok on User Behavior

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Foreword

In the pages that follow, this master's thesis takes us on a journey through the assumption of algorithms and data via a quantitative approach. This guides us through the complexities of Spotify and TikTok's algorithm and data, illuminating the key concepts and ideas that are essential for understanding this fascinating and important topic. As we read, we are struck by two important research questions, which will be presented in the next chapter, to clarify and concisely explain what these questions provide, making them accessible and engaging to readers of all levels of familiarity with the subject.

First of all, I want to thank my proficient professors, Daniel Norgård and Bendik Hofseth, at the university for being able to teach some of the interesting stuff that has given me important values, not only being a music producer, artist, songwriter and DJ, but also an important insight and value of what music business and the music industry (in plural) truly are. Moreover, with some assistance from supervisor Tor Dybo, many thanks for making this thesis happen and also find this topic quite interesting. Therefore, I am proud to present this thesis to the academic community and to the general public, where I hope that it will be widely read and cited in the future.

1. Introduction

Around 60.000 songs are uploaded on Spotify per day, adding to estimated totals of over 70 million songs by seven million artists – an undisclosed number of whom will be podcasters (Barr, Hesmondhalgh, Osborne, & Sun, 2021, p. 31).[1] On the other hand, these seven million artists do not only consist of artists, but as individual music creators; which include any number of groups and collectives (Barr, Hesmondhalgh, Osborne, & Sun, 2021, p. 31). Not only Spotify observes what users listen to, but it also examines users with similar music preferences and songs that are recommended to a user that another user has stockpiled to their device (Sanchez, 2018, p. 13).

Additionally, users are provided with the option to choose between a premium or free subscription tier, where the premium service enhances more availability, and unlimited music listening time listening with no ads while free users have limited access to ads-based and small amount of availability (Aasen, 2017, p. 18). For instance, Spotify's business model consists of free and premium models: Spotify Free and Spotify Premium. The free version is supported by ads, and the premium version, with personalized features and no ads, is accessible with a $10 per month subscription (Wang, 2022).

Notably, Spotify has by far been the most successful start-up company in applying this freemium model, however, several challenging negotiations with music rights-holders were required to conducted (Wikström, 2020, p. 123). According to CISAC reports, it is estimated that the global music subscription will surpass 1 billion by 2026, with emerging markets such as China playing a significant role (CISAC, 2022, p. 14).

In TikTok's case, the platform managed to emerge into the overseas market through the acquisition of Musical.ly in November 2017 for $1 billion, which TikTok imported to its own platform (Iqbal, 2022). It launched as a short-form video-sharing platform, TikTok's video content is manifold, ranging from an experimental audiovisual playground to entertaining

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[1] Report from the UK Intellectual Property Office: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1020133/music-creators-earnings-report.pdf

dance content, social activism, public health information, or celebrity content (Evans, Kaufman, Klug, & Qin, 2021, p. 84). Users open the app and land on the For You Page (FYP); the platforms' algorithmically-generated main feed with videos to view (Andalibi, Delmonaco, Eslami, & Karizat, 2021, p. 305:2). It has more than 2.6 billion downloads globally and over 100 million users in the US (Liu & Zhang, 2022, p. 846).

ByteDance, also owns TikTok, debuted a music app called Resso, which is released in three countries – Brazil, India, and Indonesia (Gurbaxani, Irawan, & Miranda, 2022). It enables music discovery by short-form videos often having background music which leads the user to streaming that music in the app (Adolfsson & Bonfré, 2020, p. 32).

One way or another is to look at the algorithm - do not only just represent a pre-programmed structure, but rather understood as "recipes or sets of steps expressed in flowcharts, code or pseudocode" (Bucher, 2012). John Cheney-Lippold argues that algorithmic identity can be thought of in terms of "measurable types", the sets of observed data patterns that can produce standards against which the new user data can be compared and by which users can be categorized (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 151). Algorithm have been a driving force in the public debate, in which they act for the dark power of technology and the deceptive power of leading digital companies (Cardon, 2018). With the prodigious increase in digital data, the relevance of the services offered by the leading online platforms is enormously related to their ability to sort, rank, recommend, or personalize information, which is based on a set of calculations (Cardon, 2018).

Within music streaming services (MSS), recommendation algorithms such as the right of possession ones designated for curating music, whereas MSS reckon mainly on song rating data to grant users data for access to recommending songs (Esiefarienrhe & Mogale, 2022, p. 2). For instance, Spotify and other MSS utilize music recommendation algorithms based on collaborative filtering and machine learning (Esiefarienrhe & Mogale, 2022; Wall Street Journal, 2023; Carregha, 2020; Madathil, 2017; Sanchez, 2018). Moreover, the core business model of MSS is based on every stream that counts (of more than 30 seconds), and the number of streams determines how revenue is both generated and shared among the music rights-holders (Hagen & Maasø, 2019). Not only music streaming has become indispensable to the generation of revenue for rights-holders and music creators, but it has also become the

most dominant way in which music is consumed and distributed (Barr, Hesmondhalgh, Osborne, & Sun, 2021, p. 26).

On the other hand, TikTok CEO Shou Chew explained that the recommendation algorithm is based on math - that AI and machine learning have integrated within the platform and show you content that has relevance for users in a smooth way (Chew, 2023). Moreover, TikTok's recommendation algorithms were selected as one of the "Top 10 Global Breakthrough Technologies", according to MIT Technology Review in 2021 (Liu & Zhang, 2022).

Nowadays, there are an expanded number of consumers who have the scope for access to streaming music, whereas consumers gain access to a library of music titles for the period of their membership or subscription (Papies & Wlömert, 2015, p. 316). The enlarged popularity of streaming services such as Spotify, Apple Music, TIDAL, etc., is proof of a gauge shift in the music industry that is similar to other online service industries – increasingly relies on revenues from access services (Papies & Wlömert, 2015, p. 316).

In Norway, Spotify has dominated the distribution market for quite a while and seven out of ten Norwegian Internet users utilized one of these services (Kjus, 2016). Already in 2011, 48% of Norwegian music consumers utilized a streaming service, compared with 43% in Sweden, 32% in the U.S., and 18% in the UK (Kjus, 2016).

Music and audiovisuals have become data, and data has become a digital communication for user profiling at scale – which requests us to pause and reflect (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 15). Rather than the simple collection of digital data, hence the "Big Data", it is the power and precision of calculations that clarify the emergence of algorithms as a new figure of power, and gain new insights into the uses and effects of music that was not previously possible (Cardon, 2018; Greenberg & Rentfrow, 2017).

Moreover, the European General Data Protection Regulation (GDPR) came into effect on May 25th, 2018 – encouraging EU citizens to better understand how their personal information was being utilized and encouraging them to file a complaint if their rights were violated (Herrle & Hirsh, 2019). Furthermore, an immediate effect of law enforcement in all Member

States of the EU with the aim of it being incorporated into the European Economic Area (EEA) Agreement in June 2018 (European Commission, 2022, p. 3). In terms of personal information, using cookies as a tool to provide a better framework to the website and the user, the user can provide information by filling out forms or being tracked across several websites (Hormozi, 2005). However, the user can be identified and interrupt personal information without your consent if the cookies store enough data (Koch, 2022).

On March 11, 2020, the COVID-19 pandemic took its place and countries had to implement a lockdown. [2] As the pandemic infected over 1.6 million people and killed approximately 100.000 people worldwide, it affected the world's population in terms of their daily lives (Kim, 2020). As a result, this set several restrictions where it impacted the normalcy of human life since the only occasion of going out for essential reasons (e.g., going to the stores, going to socially critical work) and for outdoor activities that did not involve physical contacts (Acar, Dyck, & Onderdijk, 2021). For musicians, in order to respond to these challenges of lockdown, they embraced new technologies within performance such as livestreaming (Morrow, Nordgård, & Tschmuck, 2022, p. 13).

In this thesis, we investigate how Spotify and TikTok users integrate and experience the algorithm to discover new music and content in addition to personal data. Thus, we ask the following research questions:

- **RQ1:** Can Spotify and TikTok users discover new music and content with the guidance of algorithms?
- **RQ2:** Does the algorithm affect the user behavior's data positively or negatively within these platforms?

1.1 Hypothesis and Method

This study is based on the following hypotheses; users will have the ability to discover new music and sound easily on both platforms determined by the algorithm. Additionally, the

[2] The pandemic was declared on that day by officials from the World Health Organization (WHO).

user's data within behavior will be more or less affected by the algorithm positively and negatively.

The research will be conducted through quantitative methods utilizing a survey. In this case, Google Survey will be used for data collection from respondents and will explore user interactions with the recommendation algorithm on Spotify and TikTok, as well as examine consumer behavior and the perceived effects of the algorithms on personal data. Additionally, the study will consider the influence of the COVID-19 pandemic on platform usage.

Participants must be between the ages of 18 and 33, regularly use both platforms on a daily basis, and be able to provide informed consent. If any of the respondents were younger than age 18 and do not use these platforms on a regular basis, will be excluded from participation and do not meet the study's minimum eligibility criteria. The survey will be distributed through a link posted on the official UiA group on Facebook and Snapchat and will be open to both international and non-international students who are native Norwegian. To ensure anonymity, personal information such as names, email addresses, and IP addresses will not be collected or stored. This will be further explained later in Chapter 3.

1.2 The Structure of the Thesis

Chapter 2 of this thesis will present a theory that untangles the algorithm underpinning the processes of Spotify and TikTok, their streaming networks, the use of big data and cookies, and how these relate to the outbreak of COVID-19 in consumption. Chapter 3 will introduce the gathered material used, leading to the presentation of the findings in Chapter 4.

Thus, Chapter 5 will engage in a more detailed discussion of the hypotheses and theories presented earlier in the thesis, introducing argumentations and reflections on the findings. Finally, Chapter 6 will provide the concluding remarks and implications of the study.

2. Theory

In this section, this study will explain further on recommendation algorithm in music streaming and audiovisual platforms, such as Spotify and TikTok, which will be primarily further discussed. In addition to the streaming network and the usage of "big data" in the music industry, this will take place in free users versus paid users (freemium and premium) of how users consume these platforms, how their data is integrated, and uncover the COVID-19 outbreak. The purpose of this study is to unfold a theory and the content which is based on the analysis of the study result.

2.1 Spotify

Spotify is the world's biggest music streaming platform by the number of subscribers, which is launched on the 23rd of April 2006, located in Stockholm, Sweden (Iqbar, 2022). As mentioned before, the platform receives around 60.000 songs per day, which are uploaded by music creators (Barr, Hesmondhalgh, Osborne, & Sun, 2021). On the contrary, Gunnar Greve, a Norwegian songwriter/producer currently representing Alan Walker and among other artists, said that today's music is being released with estimated 80.000 songs per day on Spotify (Greve, 2023). [3]

In terms of the user who utilize the platform, it had 433 million unique users in 2022, who either use the platform for free or already subscribed to (Iqbar, 2022). According to the annual report of *Swedes and the Internet*, almost 90% of the population under thirty-six now utilizes Spotify every week (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 33).

Furthermore, it is sometimes argued that Stockholm has produced one of the highest numbers of unicorns per capita in the world in terms of GDP due to the launch, as Swedish politicians have claimed (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 33). In terms of revenue, the platform increased its annual revenue by 22% in 2021 to €9.66 billion, which has tripled its revenue in the past five years (Iqbar, 2022).

[3] From Wolfgang Wee Uncut episode #368, a Norwegian podcast that brings up topics such as culture, politics, society, science etc. Highlighted at 18:36 on Spotify

According to the latest Q2 2022 report from Spotify, it is estimated that around 188 million users are subscribed to the platform (Iqbar, 2022), as you can see in the figure below the page.

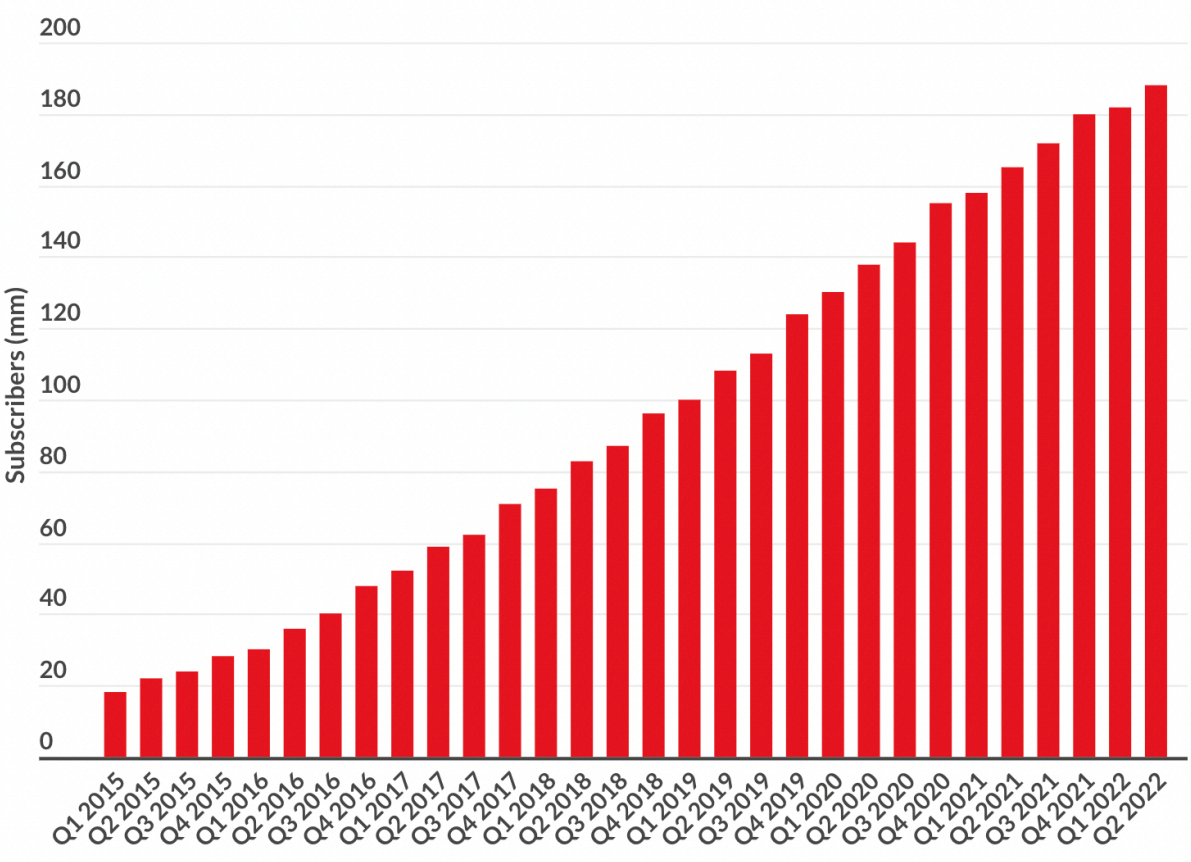

Figure 1. Spotify quarterly subscribers 2015 to 2022 (mm) *(Iqbar, 2022)*

Not only Spotify did not stop providing music for their users on their phones, tablets, computers, and smart TVs, but it expanded its playing field to reach vehicles (Dmour, Durrani, & Hujran, 2020, p. 7). In 2014, Spotify collaborated with BMW car systems to allow users to stream high-quality music on the car (Dmour et al., 2020, p. 7). In the same year, Spotify developed an integration with the Uber app to allow their users to play their favorite songs during their rides (Dmour et al., 2020, p. 7).

2.1.1 Freemium vs Premium Model

Spotify maneuvers a two-leveled freemium model – free tier and premium tier. The free tier is supported by ads, and the premium tier, with personalized features and no ads, is accessible with a $10 per month subscription (Wang, 2022). Jim Fosina, the CEO of subscription

marketing firm Fosina Marketing Group, said: "There's going to be a leveling of free and a leveling of paid, and Spotify is going to keep a foot in each camp as they make that transition to going public" (Wang, 2022). Since the launch, over 25 billion hours of listening, amount of growth of subscribers, and devices such as tools for socials and discovery features for further scaling the service (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178).

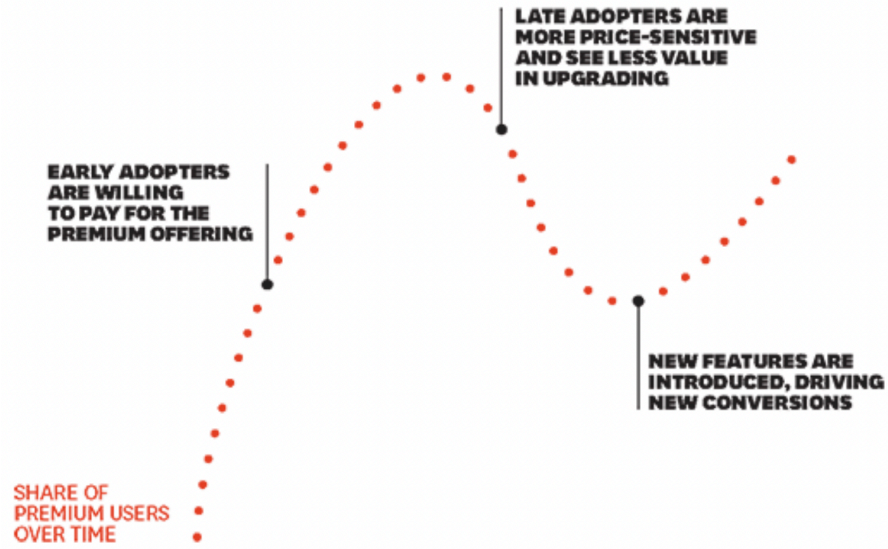

Figure 2. The life cycle of upgrades for paid subscribers *(Kumar, 2014)*

Figure 2 depicts the point of intersections when the share of premium users rises over time, then declines, and then climbs again over time based on consumption. The fundamental goal of this business model is the same as premium streaming services, which is to attract new users while maintaining existing customers (Colbjørnsen, 2020, p. 11). In order to maintain the balance between the freemium and premium models, the features have to be "good enough" for minimizing user debilitation (Wikström, 2020, p. 122). Spotify has by far been the most successful start-up company in applying this freemium model, although to preserve its free ads-funded version, several challenging negotiations with music rights-holders were required to be conducted (Wikström, 2020, p. 123).

The reason for this is that the rights-holders want the number of users who utilize the free version to be as small as possible since the revenue per ad-funded user is significantly lower than the revenue per premium user (Wikström, 2020, p. 123). Considering more or less 10% of the company's total revenue is generated through its ad sales, Spotify's financials support

the notion that the advertising industry primarily relies on customer purchases (Wikström, 2020, p. 123). Whereas 60% of their new premium subscribers have converted from being ad-funded users over a shorter or longer period, Spotify argues that their growth in revenue would be substantially hindered without the free version (Wikström, 2020, p. 123).

According to Herbert (2018), streaming services do not primarily sell music, film, television, e-books, or audiobooks, but rather "build and sell access to a library" (Colbjørnsen, 2020, p. 11). Freemium platforms typically see their paid subscription share rise and fall and then rise again in a predictable pattern over time – those who fail to account for this circumstance risk failure (Kumar, 2014). However, it is critical to acknowledge the full value of free users, which comes in two forms: some of them become subscribers, and some attract new users who become subscribers (Kumar, 2014). Based on the latest report from HBS, a free user is typically worth 15% to 25% as much as a premium subscriber, with a particular value stock from referrals (Kumar, 2014).

On the one hand, free streaming in particular could attract new customers who previously were idle or who acquired music primarily via illegitimate channels (Papies & Wlömert, 2015, p. 315). Streaming services may, for instance, be legitimately attractive to illegal file sharing (Papies & Wlömert, 2015, p. 315). Freemium is more successful than 30-day free trials or other limited-term offers, seeing that customers have become cautious of troublesome cancellation processes and find limitless free access more thrilling (Kumar, 2014).

On the other hand, free streaming, as well as premium streaming services, may appeal to existing consumers who then turn to the streaming service and minimize their expenditures on existing channels (Papies & Wlömert, 2015, p. 315). In return for providing audio content, the content publishers are paid a share of the profits from user subscription fees, normally based on the pro-rata model (Colbjørnsen, 2020, p. 11). In music, the distributors pay royalties on consumption (streaming), whereas, in media content, distributors and retailers pay in advance for rights of distribution (Colbjørnsen, 2020, p. 11).

Futuresource expects 1 billion global music subscriptions to be exceeded in 2026, with emerging markets, including China (CISAC, 2022, p. 14). While there is a slowdown in growth, due to inundation in some countries and demographics, music subscription has

become a commodity for many music subscribers (CISAC, 2022, p. 14). The music subscription market continues to exceed expectations and withstand ongoing challenges to its growth, and the living cost of the crisis is not expected to significantly reduce the momentum (CISAC, 2022, p. 14).

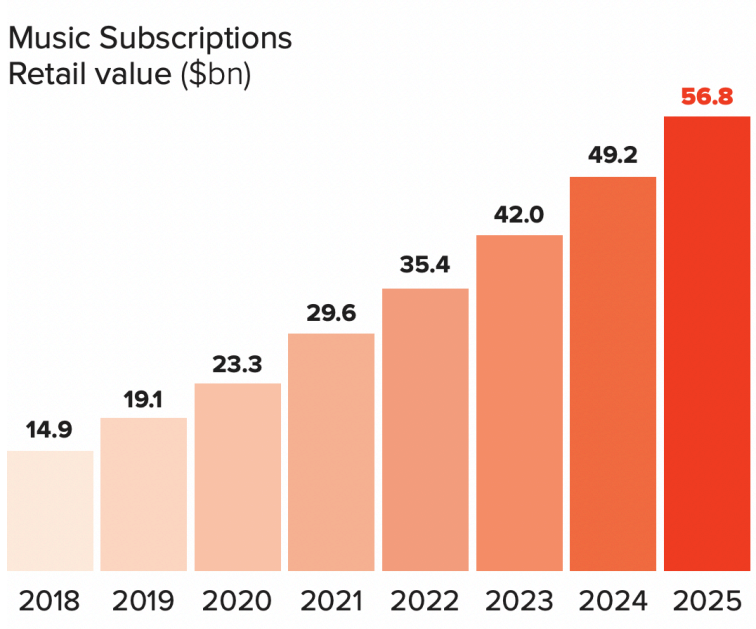

Figure 3. Music subscriptions retail value in $ billion from 2018 to 2025 *(CISAC, 2022, p. 14)*

2.1.2 Spotify's Business Model

According to Daniel Ek, the platform's business model is still more about the fusion of subscription and ads-based since the launch of Spotify, however, it is not a valid portrayal of Spotify's original business model (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 62). He also introduced some major features to the platform's core business, which included short-form videos (canvas), podcasts, and radio (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178).

Regarded as a shift from manually selected genres to automatically personalized playlists, as well as "more targeted advertising" (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178). He provided a top-down curated media self-service as a necessity for programmatic advertising, a mechanism using personal data and algorithms to buy and sell ads (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178).

The idea of selling subscriptions was rather unavoidable upon Spotify by the stakeholders of music licenses, and the economic crisis strained even stronger pressure in that direction (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178). Ek promised that Spotify would not only offer music streaming but also sell individual downloads on a pay-per-song basis – hence streaming was the future of music where "legal music" took place (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 178).

Other music streaming services such as Apple Music and Tidal, have long glared upon Spotify's tier because of its lower revenue and lower payouts, and additionally – listening to music is not worth the payment (Wang, 2022).

2.1.3 Personalized Playlists vs Editorial Playlists

Personalization is defined as "a process that changes the functionality, interface, information access, and content or distinctiveness of a system to increase its relevance to an individual or a category of individuals" (Barata & Coelho, 2021). It is a marketing strategy where consumer information is used to establish suitable solutions, and personalization needs to be refined to the dynamic user interests (Barata & Coelho, 2021). Beyond personalization, the algorithms would also take possession of spatial data (where you are), temporal data (the day of the week, the season of the year), and perhaps even the weather (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 76). Pagano (2016) stated that a focus on context "overthrows the assumption that personalization in recommender systems involves recommendation for specific individuals" (Prey, 2017).

Oskar Stål, a senior leader of personalization at Spotify, stated that: "personalization is essential to the listening experience" (Newman, 2021). Spotify's goal is to create a more holistic understanding of listeners by optimizing for long-term satisfaction rather than for short-term and by offering them more attainable content (Newman, 2021). The platform has personalized playlists that the user has access to, such as Discovery Weekly and Release Radar, where these playlists are created by algorithms that observe listeners' habits (Spotify, 2022).

Discover Weekly is a collection of unheard songs based on the songs you cherish, and the playlist is updated every Monday, while Release Radar is a collection of new songs from the artists that you follow, updated every Friday (Newman, 2021). The way how this personalization operates is that the platform utilizes machine learning, where each song is recommended using a composite code-based system with thousands of inputs (Newman, 2021).

What Spotify does, is the platform stores and analyzes the previously mentioned data to provide its users with a highly curated and customized experience (Dmour, Durrani, & Hujran, 2020, p. 7). For instance, in 2017, Spotify launched the "Your Summer Rewind" feature; this allows users in 20 different countries who have been using Spotify for over a year to listen to a personalized playlist of the music they have streamed the most in past summers on Spotify (Dmour, Durrani, & Hujran, 2020, p. 7).

Editorial playlists are playlists created by the employees of a service or high-profile, influential, marketable third parties (Parliament UK, 2021). While Spotify curates the editorial playlists, their editors are genre, lifestyle, and culture specialists with diverse backgrounds (Spotify, 2022). The editors also tailor some editorial playlists to the preferences of their listeners. For instance, a playlist of "Today's Top Hits" will contain songs the listener already appreciates but also suggestions based on their music preferences and will look different for each listener (Spotify, 2022). 85% of music uploaded on Spotify is major-owned and comprises 90% of editorial playlists, where major-owned music dominates playlists and gains a significant approach thus continues to dominate new playlists (Parliament UK, 2021).

To the extent, users proceed to collect, stockpile, and enjoy music in these digital formats as though music remained somehow a cultural object, which should be examined regarding artifacts even if they are not artifacts – but only software (Hagen, 2015, p. 4). Within the cloud, people collect lists rather than objects, and those lists provide a form of personal expression that attains from but also supersedes the record collection (Hagen, 2015, p. 4). In this matter, music is a complex paradigm of compulsive accession, because music collections are at once archives and participatory exercises (Hagen, 2015, p. 4). Hence, the user provides editorial playlists by underlining specific content on websites and services which allows them

to categorize and organize music collection content, thus creating it by others (Hagen, 2015, p. 4).

2.2 TikTok

TikTok is the leading destination for short-form mobile video where creative expression is emerged and is created by content creators (TikTok, 2022). Short-form videos are exclusively designed for people to interact with and through user-generated video content rather than with each other around it (Evans, Kaufman, Klug, & Qin, 2021, p. 84). It launched in September 2016 in Beijing, China, known as Douyin in its home market, later with a parent company called ByteDance (Dequan & Omar, 2022, p. 121). Zhang Yiming, the founder and CEO of ByteDance, incorporated a similar AI platform into TikTok, which can identify a user's interests and feed them more relevant videos (Iqbal, 2022). The platform's vision is to provide discovery for users who can search for things, create a canvas, and for the users to connect (Chew, 2023).

The default page is titled "For You" and features videos that have been algorithmically curated to correspond with each user's interests and engagement habits, not videos posted by friends (Zulli & Zulli, 2020, p. 1878). Through likes, comments, and sharing videos, in addition to the sign-up prompt where users select preferred content genres, the platform begins to filter and promote content tailored to user engagement – but viewing that content requires additional navigation through the platform (Zulli & Zulli, 2020, p. 1878). As mentioned, TikTok managed to emerge into the international market through the acquisition of Musical.ly in November 2017 for $1 billion, which added 80 million users in the US, and Musical.ly fused with TikTok into one single platform (Iqbal, 2022). In terms of revenue, the platform generated $4.6 billion in 2021, which rapidly increased in the past few years, a 142% increase year-on-year (Iqbal, 2022).

The popularity of TikTok is increasing exponentially where the app reached 1 billion users in Q3 of 2021 and is expected to reach 1.8 billion by the end of 2022 (Iqbal, 2022). In its home market, Douyin has over 700 million daily active users and is one of the most popular apps in the country (Iqbal, 2022). As you can see, the figure below is an overview of the platform's quarterly users from 2018 to 2022 in million, based on monthly active users.

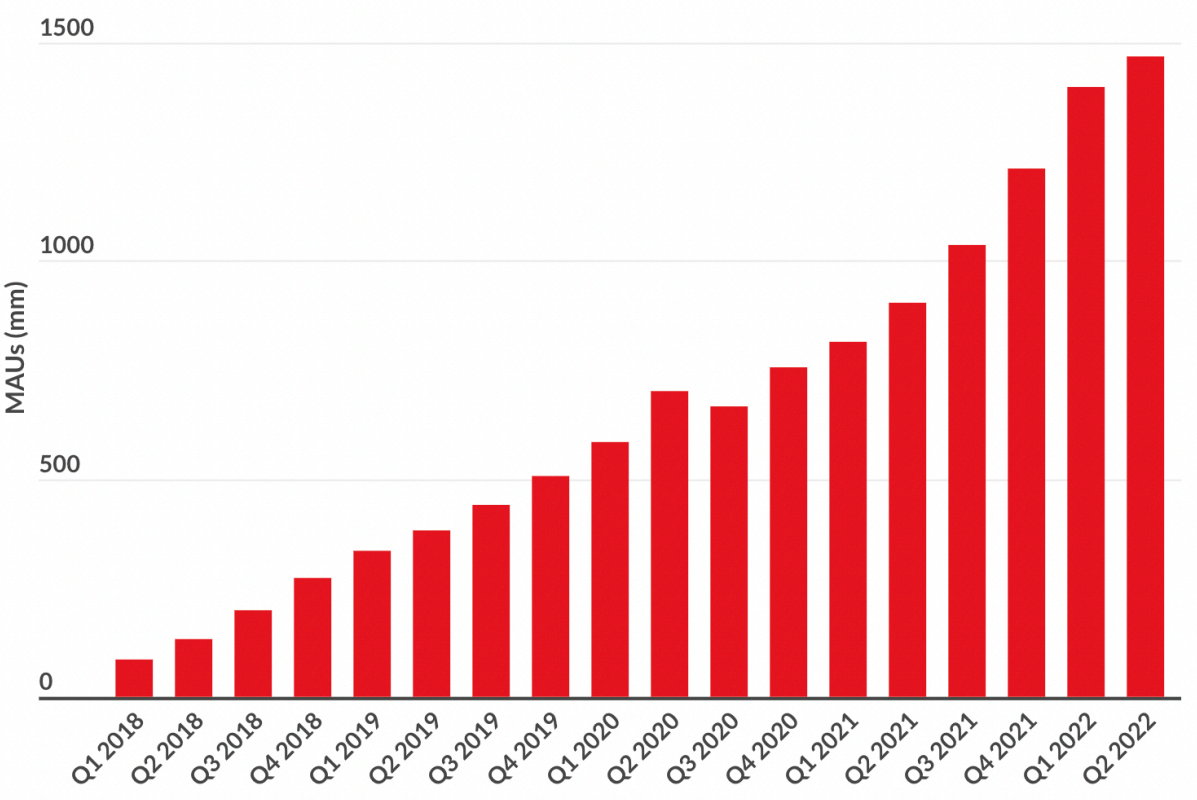

Figure 4. TikTok quarterly users 2018 to 2022 in mm, based on monthly active users (MAUs) *(Iqbal, 2022)*

2.2.1 User-generated Media

TikTok is a manifestation of user-generated media (UGM) as establishing content is its pillar, but UGM would not prosper without the content from users (Dequan & Omar, 2022, p. 122). It has also reshaped the market of video sharing where content is being created by numerous users instead of a limited number of media producers, and some short videos become popular in a short time (Dequan & Omar, 2022, p. 122). These videos are usually 15 to 60 seconds long and are based on short music or sound files, provided through the platform (Evans, Kaufman, Klug, & Qin, 2021, p. 84).

This phenomenon is often referred to as viral, where certain videos become popular through the high waves of sharing activities via email, social media sites, etc. (Dequan & Omar, 2022, p. 122). These types of viral videos attract thousands of comments and millions of views, likes, and dislikes, therefore promoting further engagement (Dequan et al., 2022, p. 122). Hence, utilizing UGM involves two important activities: establishing content and sharing the content online (Dequan et al., 2022, p. 122).

The content itself can however be in any simple way monetized, but it cannot be monetized without due attention, acknowledgment, and some type of relationship with the people who created that content (Negus, 2015). Perhaps this is why platforms that utilize user-generated content (i.e. parodies, mashups, and re-use of other creator's material) are unassertive and could lead to an interest in not asking the origin of content (Negus, 2015).

2.2.2 Imitation Public

With increased media attention and high demand, TikTok also become accustomed to new attention from academia. Zulli and Zulli (2020) explored how the platform encourages the imitation and replication of video content, establishing what they call an "imitation public" (Zulli & Zulli, 2020, p. 1877). This theorization of imitation public is initially surrounded by networks that form through processes of imitation and replication, not interpersonal connections, expressions of sentiment or lived experiences (Andalibi, Delmonaco, Eslami, & Karizat, 2021, p. 305:6).

For instance, the "sound" icon on TikTok is engaged in imitation and replication where sounds are incorporated in every video and can include songs, words from a movie, political or cultural moment, or an original sound created by the user (Zulli & Zulli, 2020, p. 1880). By watching videos, users are provided with a template for how an effect should or could be utilized, which promotes imitative behaviors; a video that is copied that used an effect because the video illustrated to the user how an effect can be utilized (Zulli & Zulli, 2020, p. 1880).

2.2.3 TikTok as a potential music streaming platform

According to a filing made by ByteDance, a TikTok Music app may apparently be in development for the US market (Rosenzweig, 2022). The application tables a variety of potential goods and services, including allowing users to purchase, play, share, and download music, songs, albums, and lyrics, as well as livestream audiovisual interactive media programming in the field of entertainment, fashion, sports, and current events (Rosenzweig, 2022). Russo, or TikTok Music, debuted in 2020 in three countries – Brazil, India, and Indonesia, with ambitions to soon expand into new territories (Gurbaxani, Irawan, & Miranda, 2022).

The music app will therefore be competing with the dominating streaming services such as Spotify, Apple Music, and YouTube, but the platform's biggest difference from Spotify and other streaming services is interactivity (Gurbaxani, Irawan, & Miranda, 2022). Users can comment on a song and share it on social media, and they can also discover other user profiles through the comment section or from the list of those who liked the songs (Gurbaxani, Irawan, & Miranda, 2022). As their metadata, they can upload a picture, a biography and a cover image for personalization, in addition to displaying user's music preferences, playlists following and followers (Gurbaxani, Irawan, & Miranda, 2022).

The exact development and release plans globally for the app are diffused, a TikTok Music platform could complement the impact the main app is already dominating the music industry (Rosenzweig, 2022). For instance, TikTok's short-form videos regularly call out the stardom of songs and musicians, with songs such as "Old Town Road" by Lil Nas X, "Stay" by the Kid Laroi, and "Drivers License" by Olivia Rodrigo where all became viral on the platform before charting on Billboard (Rosenzweig, 2022). This means that TikTok could utilize the music interest of its existing users for a new service (Rosenzweig, 2022).

2.3 The Streaming Network

To observe how the streaming network performs, using the concepts of relationships, access, control, flow, and exposure to understand the streaming network (Colbjørnsen, 2020). The term "streaming", in other words, is not just a technical form of diffusion, but rather a metaphor for the flow of information in the digital age (Morris & Powers, 2015, p. 2). Therefore, the discussion of the power of the streaming network with an instance of communication power, platform power, and algorithmic power (Colbjørnsen, 2020, p. 8). Of these intersections, algorithmic power will be further discussed in this chapter. Below the section, this figure illustrates the core streaming model.

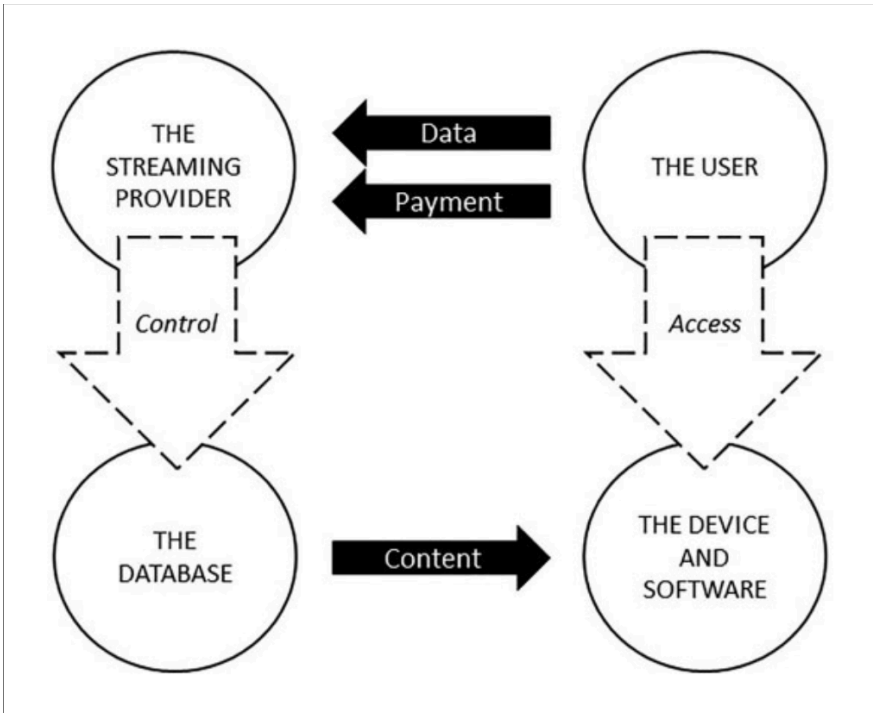

Figure 5. The core streaming model *(Colbjørnsen, 2020, p. 9)*

In Figure 5, it indicates four different sections and the structured relationships that intertwine them – so-called the core streaming model. Starting from the top left, the first section is *the streaming provider* (Spotify, Apple Music, Netflix) which controls and provides a database of content to be accessed by the user through a device or software (Colbjørnsen, 2020, p. 9). These four sections are connected by black arrows for flows, relationships of control, and access (white arrows with dotted lines) (Colbjørnsen, 2020, p. 9).

Those streaming providers are not only economic but also a "post-download era", with streaming as "the third destructive wave for the music industry in the last decade and a half" (Morris & Powers, 2015, p. 2). The user does not have access to anything such as the stream of the content itself nor to the database but must proceed via the device and streaming software – the database, however, is controlled by the streaming provider (Colbjørnsen, 2020, p. 9). Furthermore, the user is dependent on a compatible device and software from which to gain access, but there is no stream without a device, software, and access to the Internet (Colbjørnsen, 2020, p. 9). Streaming providers such as Spotify and Apple Music, access these streaming services' content takes place via apps and software, where in return the user compensates the streaming provider by providing a valuable benefit (Colbjørnsen, 2020, p. 9).

Now, it is more focused on content, which is to find ways for distributing content with the aim of monetizing content by generating revenue from streaming, data collection and analytics, cloud storage, and by attracting advertisers to sites or pages containing sounds, images, data, and information (Negus, 2015). The digital economy often involves placing musical content on various platforms and relying on user feedback and exchange within forums as a means of generating revenue, rather than investing in the production and development of artists and repertoire (Negus, 2015).

Users and content providers keep the streaming network in check by providing streams of content and payments but compared to streaming providers and device makers – they lack control (Colbjørnsen, 2020, p. 19). Users are reliant on streaming providers and must accept the terms specific to the streaming model to gain access, stuck in a network with no command over either database or device (Colbjørnsen, 2020, p. 19). The ability to control both content and user, or user and device, is more valuable than controlling minimal one because streams of payment and data are valued (Colbjørnsen, 2020, p. 19).

To note that "control" in this frame of reference, is to be aware of the music firms' ability to limit, direct or compel the flow of information (Wikström, 2020, p. 7). Additionally, Wikström (2020) stated: "it is impossible to regain the control and limit the connectivity of the network, at least not without serious consequences for common citizens' integrity that few democratic governments would be willing to accept." (Wikström, 2020, p. 92).

Furthermore, streaming providers in general offer a unique form of distribution, exhibition, and consumption of music (Negus, 2015). Since consumption occurs at the point of distribution and acquisition, allowing these services to collect data of consumer listening habits, where this information can be used to personalize the consumption experience and provide better marketing information to studios and other interested parties (Negus, 2015). This is similar to the way Netflix utilizes "increased surveillance" to gather data about viewer preferences and tailor its recommendations accordingly (Negus, 2015).

2.3.1 Algorithmic Power

Algorithms are regulated by a computing process that enables calculations to be made, based on data (Cardon, 2018). The notion of algorithmic power is often referred to as an idea that algorithms transfer some form of agentic power, and shape organization, institutional, commercial, and governmental decision-making (Beer, 2016). Bucher (2018) claims that the power of algorithmic systems comes from how they shape people's perceptions and orientations in the world (Colbjørnsen, 2020, p. 8). Understanding how algorithmic systems function, is how algorithms filter media content based on the fundamentals over, however the ordinary user has little control (Colbjørnsen, 2020, p. 8).

According to Ted Striphas (2015), recommendation services are a fine example of what scholars, have called an "algorithmic culture" (Razlogova, 2020, p. 31). The "algorithms as culture" defines them not through the inside, but rather through outside edges, how they are integrated into society, and the lives of individuals encountering them (Schellewald, 2022). At the beginning of the digital era when computers were a new thing and utilized in radio music programming; broadcasters implemented IBM machines to calculate the popularity of records played by DJs, thus creating automatic playlists (Razlogova, 2020, p. 31). However, in the twenty-first century, machine learning, often labeled "artificial intelligence" (AI), has assembled algorithmic systems that are hidden from its users, its critics, and even its engineers (Razlogova, 2020, p. 31).

As Beer (2016) stated, "it is often this ability to take decisions without or with little human intervention that is at the heart of discussions about algorithms' potential power" (Colbjørnsen, 2020, p. 8). Algorithmic power is most primarily utilized when algorithms enable and prevent the ability of users to do what they want with the content and to navigate the services as they like (Colbjørnsen, 2020, p. 8). To provide an understanding of how these powers are exerted by algorithms, it is essential to provide a few elements to avoid either understanding or overstating the power (Cardon, 2018).

Furthermore, the role of algorithmic power is often reduced to the economic interests of the platform that has created them (Cardon, 2018). Even if algorithms do apply the priorities set by their creators, it is important to gather knowledge on how they are required to translate,

displace, and transform these interests into their technical array (Cardon, 2018). Among many other factors of the way algorithms calculate: the calculating rules of algorithms are *procedural*, not *substantive* (Cardon, 2018).

These calculating rules do not have granted access to the information they manipulate, meaning that they do not have a symbolic understanding of it (Cardon, 2018). In order to produce their results, they must find procedures that allow for the best approximation of a fundamental that the users will decipher in a substantive manner (Cardon, 2018). For instance, a procedural algorithm for this task is to simply follow a set of steps to rearrange the numbers in the desired order, without considering the meaning or significance of the numbers themselves.

In contrast to procedural algorithms, substantive algorithms are concerned with the meaning or significance of the data they are processing (Cardon, 2018). Finding an approximation of substance through a set of task procedures is a hallmark of effective algorithms, where these algorithms are considered the "best" due to their efficiency and stability, and are able to translate a hypothesis regarding the desired outcome into a series of calculations based on relevant input data (Cardon, 2018). The algorithms' power may however not just be in the code, but in that way, it becomes part of a roundabout understanding of desirability and sustainability in which the algorithms are part of a code of "normalization" (Beer, 2016).

Noble (2018) exposes the discriminatory practices of search engines produced by the recreation of human biases in algorithmic code, the monopoly of a few platforms in this search engine space, and the for-profit ads in business models of search engines (Andalibi, Delmonaco, Eslami, & Karizat, 2021, p. 305:4). Regarding the amount of information users receive online, algorithms serve as gatekeepers and are often diffused with biases of those who create and operate them, rather than being a neutral code (Andalibi, Delmonaco, Eslami, & Karizat, 2021, p. 305:4). Furthermore, Benjamin (2019) refers to these algorithms as "the New Jim Code": "the employment of new technologies that reflect and reproduce existing inequities but that are promoted and perceived as more objective or progressive than the discriminatory systems of a previous era" (Andalibi, Delmonaco, Eslami, & Karizat, 2021, p. 305:4).

2.3.2 Recommendation Algorithms within Spotify and TikTok

With Spotify, music is processed through algorithms, which are utilized to analyze vast amounts of data and organize them to generate the desired outcome (Carregha, 2020, p. 3). The algorithms determine music recommendations that will be more relevant to the user, and the platform utilizes a combination of collaborative filtering, natural language processing, and audio models (Carregha, 2020, p. 3).

Ziad Sultan, the vice president of personalization at Spotify, explained that collaborative filtering observes the pattern across all the data and tries to understand when the songs happen to be playlisted together quite often (Wall Street Journal, 2023, p. 1:49).[4] The collaborative filtering model perceives the user's similar tastes, based on their consumption, and songs in common they have listened to, and then recommends the songs that only one person has listened to the other (Sanchez, 2018, p. 13). If we think of collaborative filtering as a loop, the user receives the recommended object with the highest rating as a result of the user's evaluation. In other words, this loop should run continuously to improve the recommendations since it takes time – based on the data and user's interests, similar to the other user who also shares the same interests (Madathil, 2017, p. 2).

Natural language processing (NLP) is a subdomain of AI where it can form a text or voice as an input to process that language to provide relative output to the user (Pathak, 2021, p. 9). The first two of these algorithmic tasks are based on popularity, meaning that songs that are well-liked by other users or talked about favorably on the cloud will be recommended (Carregha, 2020, p. 3).

As mentioned before in the topic of music personalization, such as "Discover Weekly" and "Release Radar", these tailored recommendations are based on their likeness to the user's recently streamed artists, which is calculated through comparison with other users who seem to have similar taste via collaborative filtering (Eriksson, Fleischer, Johansson, Snickars, & Vonderau, 2019, p. 151). Based on stockpiled data and feedback loops between

[4] Sultan from Spotify explains how collaborative filtering works, highlighted at 1:49 from Wall Street Journal interview: https://www.youtube.com/watch?v=pGntmcy_HX8&ab_channel=WallStreetJournal

recommendation distributions and users' actions, algorithmic systems work repressively – they attempt to predict user preferences and therefore also tend to form user practices (Eriksson et al., 2019, p. 151).

According to Wikström, there is a highly debated question of how algorithmically curated playlists impacts the music listeners' relationship with artists and music in general (Wikström, 2020). These playlists could do either good or bad, but if it is considered good, they reduce the music listeners' cognitive load by essentially undoing the need to develop relationships with artists and bands (Wikström, 2020, p. 195). In other words, consumers don't need to recognize artists in order to get a satisfying musical experience, since the only relationship the listeners need to handle is the one with their access-based music service provider (Wikström, 2020, p. 195).

Unlike Meta, Instagram, or YouTube, and their short-video versions of Instagram Reels and YouTube Shorts, TikTok does not generate video feeds based on the content from users followed (Evans, Kaufman, Klug, & Qin, 2021, p. 85). The platform's CEO Shou Chew explained how the recommendation algorithm work on the platform at TEDTalk:

"The recommendation algorithm - it is just math. For instance, if the user likes videos 1, 2, 3, and 4, and you like videos 1, 2, 3, and 5, and maybe another user liked videos 1, 2, 3, and 6. Now, what's going to happen is because we like 1, 2, and 3 at the same time, he's going to be shown 4, 5, 6 and so are we. And you can think about this repeated at scale in real-time, across more than a billion people – that's basically what it is math (…) AI and machine learning have allowed this to be done at a very big scale, and the results of this is that they learned the interest signals that people exhibited quickly, and shows you content that's really relevant for you in a very quick way." (Chew, 2023)[5]

The TikTok recommendation algorithm customizes video content for the individual user's FYP, based on previous and continuous user engagement with audiovisual content through video viewing time, liking, commenting, and sharing (Evans et al., 2021, p. 85). Additionally,

[5] Chew explains the recommendation algorithm highlighted at 5:57 from TED Talk video: https://www.youtube.com/watch?v=7zC8-06198g&ab_channel=TED

the FYP is generated from videos that utilize trending hashtags or sounds and simply put – the output of the TikTok algorithm can become visible to users by constantly learning their video content preferences (Evans et al., 2021, p. 85). This will be further explained later in the discussion chapter.

According to MIT Technology Review in 2021, TikTok's recommendation algorithms were selected as one of the "Top 10 Global Breakthrough Technologies" (Liu & Zhang, 2022, p. 846). For instance, ByteDance, the parent company that owns TikTok, utilizes computer vision technology to automatically search and categorize visual objects, and AI in natural language processing to identify text elements and audio files in TikTok videos (Evans, Kaufman, Klug, & Qin, 2021, p. 85). Computer vision enables a system to detect digital media like images and videos to extract information from them and convey information to the user about the digital media in addition to possible recommendations (Pathak, 2021, p. 9). This is mainly because the algorithm satisfies each consumer's specific interests and does not only regard the "herd effect" of following hotspots (Liu & Zhang, 2022, p. 846).

Recent studies by Ruckenstein and Granroth (2020) on advertising algorithms have shown how users often feel lonely and ill-equipped in their sense-making when they confront recommendation algorithms that seem confusing and disturbing to them (Schellewald, 2022). They can however select the content they see online following the logic of personalization, whereas the flow of information by itself does not assist them in moments of disturbance (Schellewald, 2022). Hence, this kind of information does not provide them with position and support in the pragmatic sense of allocating with algorithms daily (Schellewald, 2022).

2.3.3 Algorithm Biases – The Cold Start Problem

Around 70 million songs are released on Spotify alone, and according to a statistical report released by Spotify, four million out of 70 million songs on the platform have never been played - not even once (Esiefarienrhe & Mogale, 2022; Barr et al., 2021). Understandably, this causes an outburst among content creators who trust and pay Spotify as a music streaming platform to distribute their music (Esiefarienrhe & Mogale, 2022, p. 2). Hodgson (2023) stated that the danger with algorithms was that they could underpin existing biases. In this case, a well-round catalog of music contains more male artists than female artists, and as

listeners start to engage with that catalog, those biases become enlarged, thus creating a "feedback loop" (Wall Street Journal, 2023, p. 4:09).

Furthermore, the algorithm fails to recommend astonishing music to the users that they can enjoy, and this results in the platform confronting "dark music" or niche music that has never received any streams (Esiefarienrhe & Mogale, 2022, p. 2). Combined with the concept of *the mere exposure effect*, observed by Zajonic (1968), which is *the observation that liking for a stimulus increases on repeated exposure to that stimulus* (Citkowicz, Horton, Lauber, Montoya, & Vevea, 2017, p. 459). From a user's music listening perspective, songs with unfair exposure get listed by listeners and crowd out other songs which may have been preferable by the listener in a counterfactual way (Crabtree, Hunter, McQuillan, Turnbull, & Zhang, 2022, p. 1).

In order to reduce those biases, Spotify's research team evaluates and minimizes potential algorithmic imbalances and aims for transparency about its impact. Another dilemma is that the algorithm is not optimized for new artists due to no user data – which is known as the cold start problem (Wall Street Journal, 2023, p. 4:34). According to Hodgson (2023), there were certain metrics utilized in the platform's audio analysis and might be culturally biased, because if we compare with Western music to Eastern music – they have different musical systems and cultures that are entirely different.

In TikTok's case, the user majority are aged under 30, with the largest age bracket aged between 10 and 20 years old (Iqbal, 2022). Around 28% of users are 10-19, 35% of users are 20-29, 18% of users are 30-39, 16.3% of users are 40-49, and 2.7% of users are 49+ (Iqbal, 2022). Unlike all other social media platforms, TikTok's users have a young target group, who are more naïve and unaware when it comes to malicious contents (Masri & Weimann, 2020). According to several researchers, it takes less than 30 seconds to find harmful content on the platform, and a few hours for the algorithm to control users' feeds with offensive videos (Day, Dias, McGregor, Courners, & Hack, 2021).

Tech advocacy organization Reset Australia ran some tests and discovered that it takes about four hours for the algorithm to assimilate that a 13-year-old is interested in racist content, and about seven hours for sexual content to appear in users' feeds (Day et al., 2021). The longer

they watch that kind of content, the more frequently they appear (Day et al., 2021). Dr. Niels Wouters, an AI researcher at the University of Melbourne said: "As humans, we all have biases. But when we create an algorithm, we are absolutely at risk of embedding our own biases in these algorithms" (Day et al., 2021).

To prevent those biases, TikTok's Community Guidelines prohibit content that is false or misleading, including misinformation related to topics such as COVID-19, eating disorders, preventing racism, vaccines, and anti-vaccine disinformation (TikTok, 2022). The platform's mission is to inspire creativity and bring joy, however, the majority of users are in the minority group and can easily access harmful content which defies the values and the guidelines of TikTok without preventing it (Masri & Weimann, 2020).

2.4 The Big Data

Big data could be defined as "a huge collection of data records that could be stored and analyzed to provide insights for enterprises to improve revenue and cut costs efficiently" (Dmour, Durrani, & Hujran, 2020, p. 5). Today, big data is a phrase used to define massive volumes of structured and unstructured data that is of such scale, and difficult to process and analyze using traditional database and software techniques (Aalto Capital, 2020, p. 3). Its definition does not rely only on the volume of data, but also in the technology that manages the data (Aalto Capital, 2020, p. 3). For instance, big data may be several petabytes (PB) of data points on the watching habits on TikTok, or the amount of listening time on Spotify (Aalto Capital, 2020, p. 3).

Within the music industry, in terms of collecting and analyzing big data generated by users, they allow businesses to provide a personal and unique experience for each customer, for instance, to know what users like, and dislike, what genres and songs they like, etc. (Dmour, Durrani, & Hujran, 2020, p. 8). Furthermore, big data analysis can provide some important insights into the music industry, and such analysis can enable artists to detect what their followers are interested in, and what they like or dislike about their music (Dmour, Durrani, & Hujran, 2020, p. 8). To manage big data substantially and securely, it could solve the problems of traceability and accountability in the global music industry (Aalto Capital, 2020, p. 3).

On the contrary, by utilizing big data analysis in online music streaming services, many fear the control of "popular" music, which may set a limit for some musicians to change their style to fit the trend and establish new followers (Dmour, Durrani, & Hujran, 2020, p. 8). However, these assumptions are not true, due to the static mechanisms may direct the previously mentioned musicians into a niche market that admires their music, and if reached, this will allow musicians to achieve popularity (Dmour, Durrani, & Hujran, 2020, p. 8). As mentioned before with the concept of the mere exposure effect, for instance, the artist playing a specific song with a specific genre in the US may not be considered popular but can perhaps find another niche of followers in another country (Dmour, Durrani, & Hujran, 2020, p. 8). With the availability of online marketing, a fan base could assist with showing how Spotify uses big data and Internet technologies to ensure its success in the market (Dmour, Durrani, & Hujran, 2020, pp. 8-9).

According to Klais's study (2022), Google and TikTok were the two apps that collected more data than any other app (Zulkifli, 2022). Google is clearer in claiming that collected data are used for its purposes of optimization, however, TikTok is not (Zulkifli, 2022). An article from CNBC states that TikTok allows third-party trackers to collect users' data and collects more data than any other social media platforms (Zulkifli, 2022). Consequently, the trackers would remain in place, even if users choose not to be tracked through the app settings (Zulkifli, 2022). In clarity, a large chunk of your data gets collected by TikTok and the exact data that are collected are made explicit, as shown in the following line from the platforms' privacy policy:

"We collect certain information about the device you use to access the Platform, such as your IP address, user agent, mobile carrier, time zone settings, identifiers for advertising purposes, model of your device, the device system, network type, device IDs, your screen resolution and operating system, app and file names and types, keystroke patterns or rhythms, battery state, audio settings, and connected audio devices. Where you log in from multiple devices, we will be able to use your profile information to identify your activity across devices. We may also associate you with information collected from devices other than those you use to log in to the Platform." (Zulkifli, 2022)

2.4.1 Datafication, Dataveillance, and Connectivity

The concept of "datafication" was first introduced by Mayer-Schönberger and Cukier (2013) to describe the process of tracking, quantifying, and analyzing everyday life to make predictions (Hagen & Maasø, 2019). Van Dijck (2014) stated that datafication is seen as a valid means of understanding and monitoring human behavior, not just by technology experts, but also by scholars who see it as a valuable research tool (Hagen & Maasø, 2019).

The notions of trust and belief are particularly relevant when it comes to understanding "dataveillance" as a preferred way of monitoring citizens through social media and online communication companies (van Djick, 2014). To distinguish from surveillance with dataveillance is that surveillance conjectures monitoring for specific purposes, whereas dataveillance implies the continuous tracking of metadata for unstated purposes (van Djick, 2014).

In the new music economy, the value of physical music distribution and mass media has been radically narrowed, while the value of Internet media has increased (Wikström, 2020, p. 6). The technologies lower the barriers, which had previously regulated the capability to distribute information to the network, for instance, the capability to upload information to the cloud (Wikström, 2020, pp. 6-7). Furthermore, the capability to upload is theoretically accessible to the general public connected to the network. As for that matter, the connectivity of the user network has extended, which in turn has resulted in the music firms losing their regulation to control the flow of information (Wikström, 2020, p. 7). In other words, the new music industry dynamics are distinguished by high connectivity and less control (Wikström, 2020, p. 7)

Zuboff (2019) argues that platforms utilize surveillance to collect data on users that produce an accurate model of who we are, and they use this to see our preferences and habits (Richards, 2021, p. 3). For instance, TikTok controls what content users observe, and the users lose the ability to shape their future, because their data are controlled, and are no longer autonomous individuals (Richards, 2021, p. 3). By allowing platforms to collect and sell our data, we have unintentionally commodified ourselves and lost our autonomy (Richards, 2021, p. 3). TikTok utilizes surveillance to collect data with the mission to control and exploit the

user, even though many people are still unaware of how far these platforms go for users' precious data (Richards, 2021, p. 3). He stated that we are confined in a world of surveillance as a commodified product, however, we may enjoy utilizing the platform as a source of empowerment (Richards, 2021, p. 3).

2.4.2 What is GDPR?

The EU General Data Protection Regulation (GDPR) is a pan-European data protection law that was established in May 2016, where it is intended to strengthen user's rights concerning personal data and ensure data protection to fit the digital age (European Commission, 2022, p. 7).[6] The GDPR has two high-level missions: to harmonize the previously fragmented legacy legislation among EU Member States and to address public perceptions that doing business on the Internet is undoubtedly risky (European Commission, 2022, p. 3). Due to concerns about successful cyberattacks resulting in personal data theft, the exponential increase of mobile phones, the adoption of big data analytics, and increased volumes of personal data being digitally generated, processed, and shared have exposed personal identities to greater risk (European Commission, 2022, p. 3).

Since the implementation of GDPR, more people clicked "I agree" and "I accept" than in previous years (Herrle & Hirsh, 2019). Pop-up buttons and frequent emails asking for consent were their primary interactions with the new legislation, which is to provide a privacy notice, and soliciting user consent were the assertive approaches to compliance taken by most organizations (Herrle & Hirsh, 2019). While user interactions with GDPR are increasing domestically, citizens' attitudes about and expectations of data surveillance are not keeping pace (Herrle & Hirsh, 2019). On the other side, citizens' awareness of data protection and data privacy has increased (Herrle & Hirsh, 2019). According to an EU survey, 73% of EU citizens have heard about at least one of their new rights, whereas only three in 10 Europeans are aware of all of their rights (Herrle & Hirsh, 2019).

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[3] See article 5 of the definition of personal data: http://euro.ecom.cmu.edu/program/law/08-732/Privacy/understanding-the-gdpr.pdf

2.4.3 Cookies

Cookies are small text files and contain strings encoding which is relevant to the user (Park & Sandhu, 2004, p. 36). Nevertheless, cookies are safe and provide major functions for websites and they can also be easily observed and deleted (Koch, 2022). For instance, a cookie could track users' items in an online shopping cart or the last page they visited before leaving (Komnenic, 2022). Websites interpret these cookies to provide users with a more personalized experience, such as returning their items to the cart or leading them to their most recently visited page (Komnenic, 2022). The cookie's purpose is to acquire information for utilization in subsequent server browser communications without asking for the same information (Park & Sandhu, 2004, p. 36).

Marketers and advertisers utilize cookies for stockpiling demographic information about users (Hormozi, 2005). If a new user sees an ad for the first time from a server, the browser is assigned a unique ID that is stored with one's other cookie files (Hormozi, 2005). Visiting a website that contains an ad from that server, cookies will be used to highlight the most effective advertisement, based on one's interests determined by the information which was previously provided (Hormozi, 2005). The user could provide the information directly by filling out forms or being tracked passively across several websites (Hormozi, 2005). The more information a user provides, the more cookies can guide the user in finding the information or products desired (Hormozi, 2005).

On the next page, we can see an overview of several countries globally either agreeing or disagreeing with accepting cookies with the following statement: "When I open a website and it asks me about cookies, I always click 'accept all' (%).

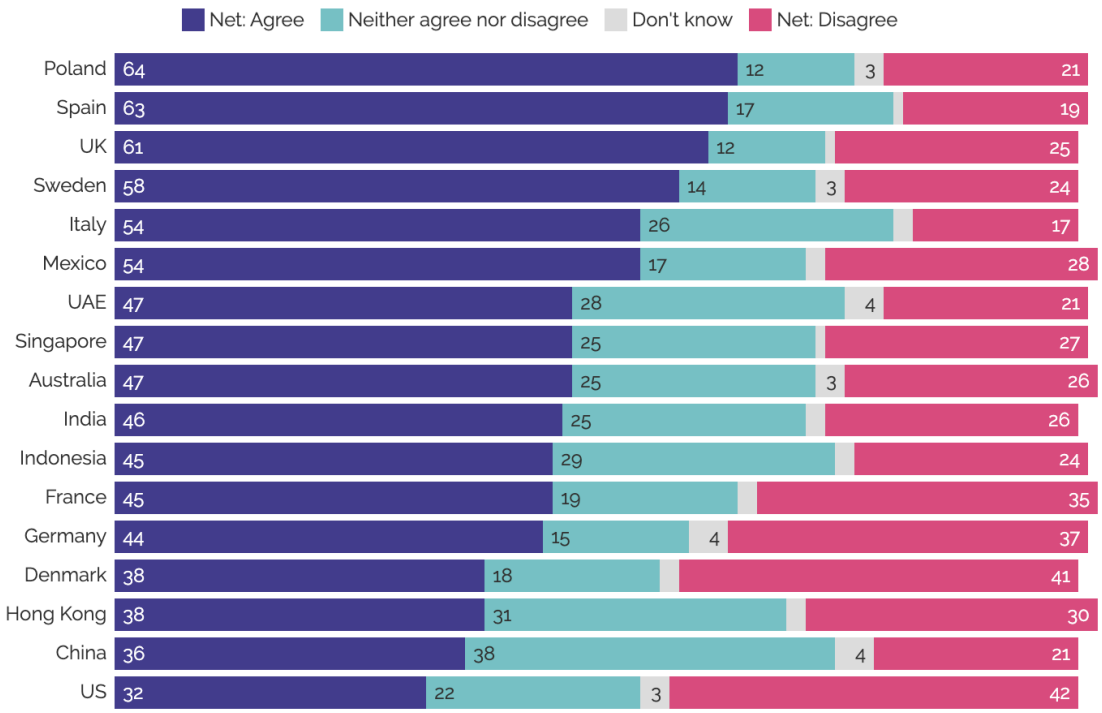

Figure 6. How consumers respond to cookies disclosures globally *(Nguyen, 2021)*

This survey was conducted by YouGov, which asked consumers in 17 markets about what they do when they see cookie disclosures. [7] Poland is the country which stands out with the most respondents of 64% that accepts cookies, while only 21% disagree (Nguyen, 2021). Especially in the US, it stands out with consumers most likely to disagree they accept all cookies when asked for a consent, just a 1/3 of US consumers agree they accept all cookies while 42% disagree (Nguyen, 2021).

Although cookies can store enough data, it will potentially identify you as a user without your consent (Koch, 2022). Cookies can track users' online activity and advertisers use that as a tool to target the user with specific ads, given the amount of data that it contains (Koch, 2022; Lavin, 2006). For instance, if a website has a customer database containing information such as names, payment histories, and credit card numbers, the site utilizes cookies to store point-

[7] Cookie disclosures survey conducted by YouGov: https://business.yougov.com/content/37531-global-cookies-disclosures-behavior-survey

number is exposed in a cookie without exposing the actual customer data (Park & Sandhu, 2004, p. 37).

As mentioned, this is why private information should not be stored in a cookie and should be utilized only for storing the ID of the user (Hormozi, 2005). The lack of privacy is one of the main concerns about cookies since they allow web servers to track a user's browsing behavior, although it cannot release contents of a user's hard drive due to a cookie is written in a text file (Park & Sandhu, 2004, p. 37). In fact, cookies can be considered personal data in certain circumstances and correspond to GDPR (Koch, 2022).

Furthermore, users may have a right to be concerned about their privacy regarding cookies being utilized (Hormozi, 2005). If users are concerned about their privacy, personal information should not be provided to websites that utilize cookies, and reading the privacy policies of websites can help users to determine whether or not they want to provide the website with their private information, such as clicking "I Agree" or "I Disagree" (Hormozi, 2005). With network information, which provides more data than tracking on a single site, it ensures effective identification of web users' interests and as a result, the placement of advertising most likely to be of interest to those users (Lavin, 2006, p. 280).

2.5 How COVID-19 Impacted the Music Industry and Social Media

People lived a restricted life since they were only allowed to leave their residences for essential reasons (e.g., going to the stores, going to socially critical work) and for outdoor activities that did not involve physical contacts (Acar, Dyck, & Onderdijk, 2021). Working from home was a norm, however, it is still implemented today, this impact in different ways within divergent experiences by different people and groups in society (Morrow, Nordgård, & Tschmuck, 2022, p. 12). Due to these restrictions, all music events and concerts with live audiences were forbidden, resulting in the cancelation of music concerts and festivals, and the temporary shutdown of nightclubs (Acar, Dyck, & Onderdijk, 2021).

It led to a reduction in new music, and it may also more or less likely reduce consumers' total consumption and spending time as music fans put a high value on listening to the latest songs (Burmester, Clement, Denk, & Kandziora, 2022, p. 3). Furthermore, a decrease in commuting

time or closed gyms might also affect the consumption time of recorded music (Burmester, Clement, Denk, & Kandziora, 2022, p. 3).

In that matter, the setbacks of COVID-19 have accelerated the transition towards on-demand streaming services and away from ownership-based models, where Spotify's shares went up 27.1% from the beginning of the year through May 21, 2020, (Cho, Hwang, Sim, & Telang, 2022, p. 19). In addition, music consumption significantly decreased by 12.5% after the World Health Organization (WHO) pandemic declaration (Cho, Hwang, Sim, & Telang, 2022, p. 20).

Despite lockdown measures and social distancing as the new occupancy of normalness, musicians were able to live stream while playing music and could bring people to socialize or experience livestream concerts (Acar et al., 2021; Morrow et al., 2022). Some music concerts and festivals shifted to online platforms, where those platforms often live-streamed through social media or video platforms such as Meta, Twitch, TikTok, or YouTube (Acar, Dyck, & Onderdijk, 2021). Moreover, these events were often broadcasted live to audiences, ranging from small groups of individuals to thousands or even millions of people around the world through online platforms (Acar, Dyck, & Onderdijk, 2021). Popular artists could consider a virtual live-streamed concert event with a pay-per-view option, for instance, the K-pop band BTS, drew nearly 760,000 viewers worldwide and generated $20 million in ticket sales in June 2020 (Cho, Hwang, Sim, & Telang, 2022, p. 30).

An analysis conducted by Ostrovsky and Chen (2020), given the 100 most popular videos in each of the three largest COVID-19-related categories on TikTok, these were videos with the hashtags "COVID-19", "COVID19", and "coronavirus" that reached 4.4 billion, 33.3 billion, and 93.1 billion views (Chen & Ostrovsky, 2020). Their findings revealed that, on average, 6.33% of videos were filmed by healthcare professionals, and 2.66% were filmed by young adult patients on their recovery journeys (Chen & Ostrovsky, 2020). In addition, 15.66% of videos provided pragmatic health information, and 0.66% provided misinformation health advice, with the remaining videos containing quarantine activities in a satirical manner (Chen & Ostrovsky, 2020).

3. Presentation of Collected Materials

This chapter explains the materials carried out and the data collection method chosen. Based on this thesis problem, a quantitative method was considered to be the most suitable data collection method.

For collecting data, we utilized and conducted a quantitative method and established a survey via Google Survey for this thesis. As mentioned before, the criteria for participating must be a minimum of age 18 and a maximum of age 33 due to informed consent, using Spotify and TikTok on a regular basis (at least once a day or a week). For further publicity of conducting the survey, this was posted through a Facebook group called "Musikkstudenter UiA, konsen", the official group of the University of Agder, and utilized Snapchat. We figured that between 18-33 were the perfect target group since the majority within that group utilizes these platforms more often, and therefore would be easy to collect data in a short time. The respondents' identities were anonymous, and their data were treated confidentially in accordance with privacy protection. Respondents were early informed that it would take approximately 5-7 min to complete.

3.1 Measures and Data Analysis

The survey included several multiple-choice questions, tick questions, and Likert scales (with implementing factors referring to enhancing the status of the tested object, for instance; 1 = "*not acquainted*", 3 = "*more or less acquainted*" and 5 = "*most acquainted*"). It consisted of the following four segments in order:

1. ***General information***: This contained questions that were based on general demographics, educational level, utilizing Spotify and TikTok on a regular basis, and what devices they utilized.
2. ***Spotify***: This segment contained subscription-related questions and if the respondents were acquainted in terms of how algorithms function, music discovery, and user behavior.
3. ***TikTok***: Same as the Spotify segment in terms of the algorithm work, virality, and the encounter of malicious content within the platform, in addition to user behavior and consumption.

4. ***Data algorithms and COVID-19 within Spotify and TikTok***: As a whole, this segment corresponded with respondents' assumption of algorithms and data, and the COVID-19 incident based on consumption within Spotify and TikTok.

In this survey, all the data were processed in Google Surveys and Microsoft Excel, and the graphs were utilized and gathered from respondents for data collection. The term "algorithm" and "GDPR" were not defined in this survey because of the unnecessary time-consuming and perhaps some of the respondents were not familiar with the term. The attachments for the survey will be shown at the end of the thesis.

4. Findings

Overall, there were 27 questions in total from the survey, whereas 2 of the 27 questions are optional to provide an answer. First, general information will be introduced, following the segments of Spotify, TikTok, and lastly, the algorithms and data within Spotify and TikTok, in addition to COVID-19 platform consumption. The purpose of presenting results is to communicate the research findings in a clear and conductive manner, and to contribute to the existing knowledge on the following topic and therefore discuss the implications of the results.

4.1 General information

In total, 77 respondents (n = 77 = 19 males, 58 females) participated with valid responses collected. The target group were age 18-33 (where age 18-21 had the most participation) of 58.4% (n = 45), age 22-25 had 32.5% (n = 25), age 26-29 had 2.6% (n = 2), and age 30-33 had 6.5% (n = 5). The majority of respondents were students or have graduated, 94.8% (n = 73) were students, while 2.6% (n = 2) have never been students before and the remaining percent were going to attend next year. In terms of education level, 54.5% (n = 42) were taking or had graduated with a bachelor's degree, 27.3% (n = 21) with a master's degree or still attending, and 18.2% (n = 14) was taking a year course. None of them was taking a Ph.D.

All of the respondents utilized Spotify and TikTok daily, and the devices that they are using may vary, depending on what occasion. Devices such as cell phones, PC/Mac, tablets, TV, streaming devices (e.g. Apple TV, Google Chromecast), and consoles (i.e. PlayStation, Xbox). Respondents could choose several options – cell phones were mostly used by all of the respondents with 100% (n = 77).

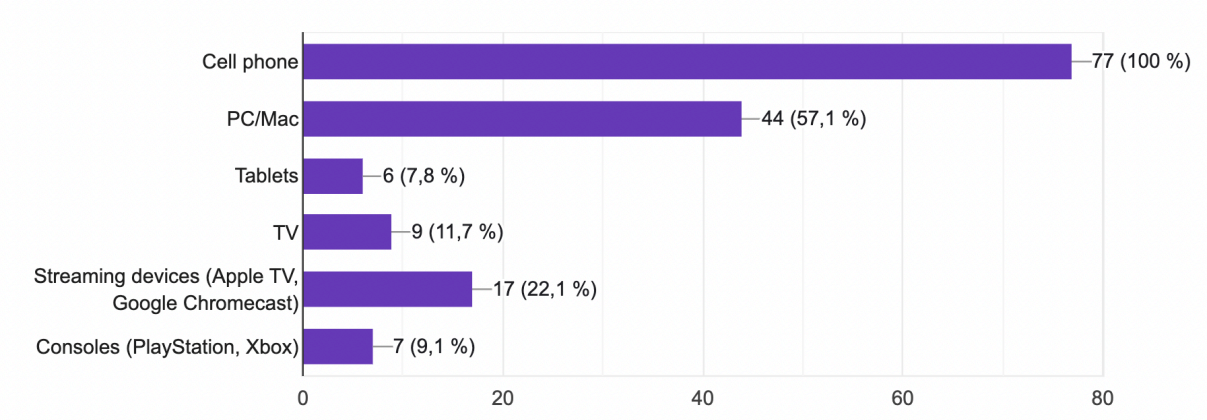

Figure 7. Devices they use for utilizing these platforms, where cell phone is the most used device by respondents.

4.2 Spotify

This segment contains subscription-related questions such as what tier the respondents are using, how well they are acquainted with algorithms, and the integration of music discovery in addition to satisfaction or dissatisfaction on user behavior. Overall, there are 98.7% of respondents (n = 76) who have Spotify Premium, while there was 1 out of 76 respondents (1.3%) who utilize Spotify Free.

4.2.1 Music Subscription

Since there was only one respondent who does not utilize a premium subscription to Spotify, the remaining respondents are fairly acquainted with how these different tiers work and what they are actually using. It is indeed some interesting choices from these four pieces of the diagram, where 51.3% (n = 39) utilized a family subscription, followed by 22.4% (n = 17 (student), 21.1% (n = 16 (individual), and 5,3% (n = 4) (duo). Every tier provides a premium subscription but with features in terms of cost efficiency and method of utilization. According to Spotify, the cost of utilizing these tiers is estimated between 65-189 NOK, where the "student" tier is the affordable one with 65 NOK, and the "family" tier is roughly around 189 NOK.[8]

[8] Note that Spotify subscription fees may vary over time, 65-189 NOK is an estimated amount followed by different tiers. Source from Spotify

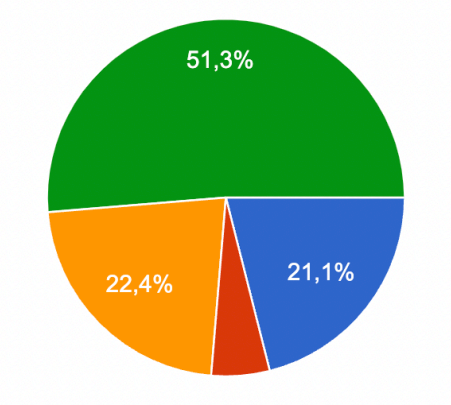

Figure 8. Different tiers within Spotify Premium (green = Family, orange = Student, red = Duo, blue = Individual)

4.2.2 Acquaintance of Spotify Algorithm

Respondents were asked a question about whether they were acquainted with how the algorithms work on Spotify or not. Thus, they were given a Likert scale from 1-5 they could provide a rating (where 1 = not acquainted, 3 is both, and 5 = most acquainted). Overall, 24.7% (n = 19) were not acquainted with algorithms, 19.5% (n = 15) were fairly not acquainted, 26% (n = 20) were more or less acquainted, 20.8% (n = 16) were fairly acquainted, and 9.1% (n = 7) were most acquainted.

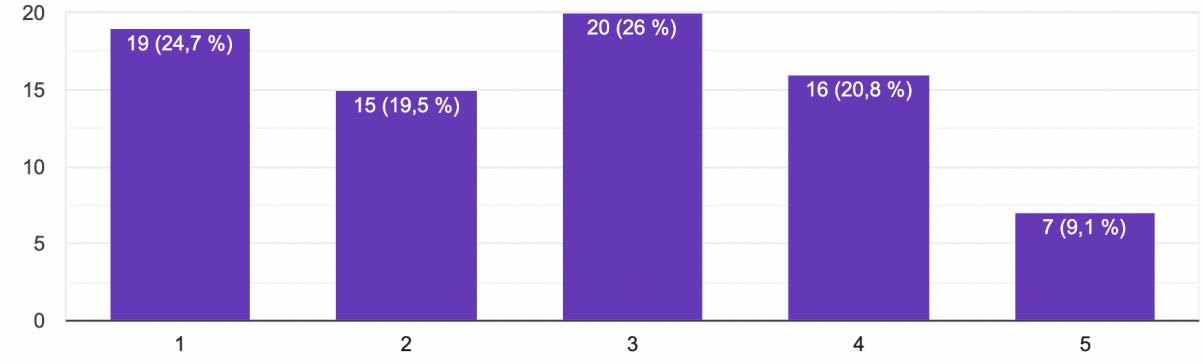

Figure 9. Acquaintance of how the algorithm function on Spotify (1 = not acquainted, 3 is both, and 5 = most acquainted)

4.2.3 Music Discovery

In terms of music discovery, respondents could choose several options within this category, where the selection of music discovery could be through personalized and editorial playlists, via TikTok, through a friend, social media platforms, and radio. Around 72.7% (n = 56) discover new music through personalized playlists, 53.2% (n = 41) through editorial playlists,

61% (n = 47) via TikTok, 62.3% (n = 48) through a friend, 55.8% (n = 43) via social media, and 22.1% (n = 17) listened on radio.

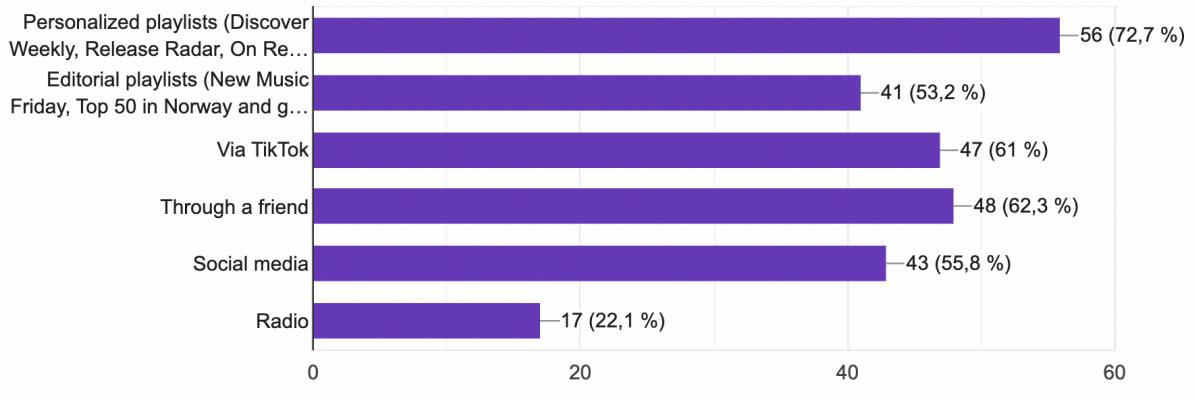

Figure 10. Where do respondents discover new music?

The next figure is about algorithms and if it provides a new music discovery based on user preference. On the contrary, most respondents think that it is easier to discover new music based on user preferences with the assistance of algorithms. 3.9% (n = 3) answered not likely that algorithms provide a better shortcut for discovering new music, the same as 3.9% (n = 3) but fairly, 15.6% (n = 12) answered both, while 49.4% (n = 38) thinks it is indeed easier, and 27.3% (n = 21) provided an answer with no doubt that the probability is higher with the guidance of algorithms for providing an undemanding music discovery.

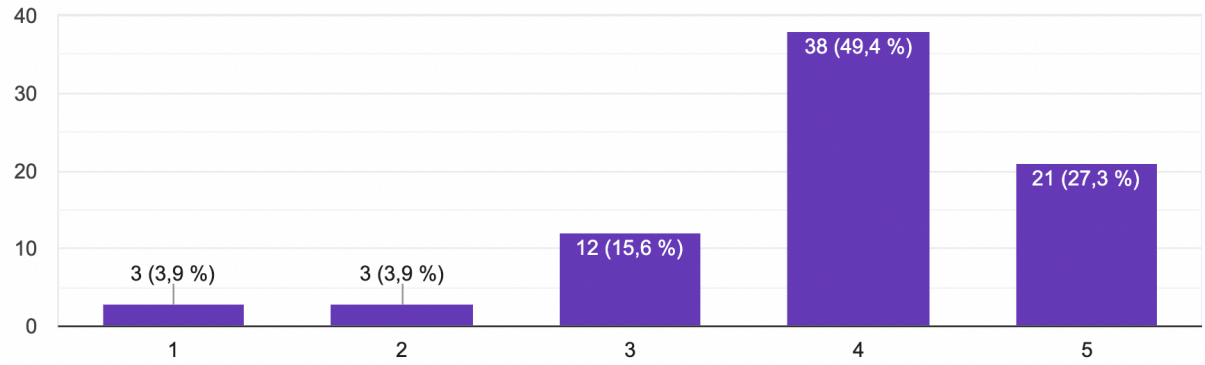

Figure 11. Do you think the algorithms make it easier to discover new music based on your preferences? (1 = not likely, 3 is both, and 5 = most likely. 4 has the highest percentage of 49,4% with 38 respondents)

4.2.4 Consumer Satisfaction with Spotify

Lastly, respondents were given a question of satisfaction with Spotify as a consumer, in terms of user behavior and consumption. Respondents provided with valid answers, 45.5% (n = 35) were very satisfied, 31.2% (n = 24) were satisfied, 16.9% (n = 13) were more or less satisfied,

while 3.9% (n = 3) were less satisfied and the remaining 2.6% (n = 2) were not satisfied with Spotify at all. Overall, 35 out of 77 respondents were very satisfied with Spotify in terms of user behavior and consumption.

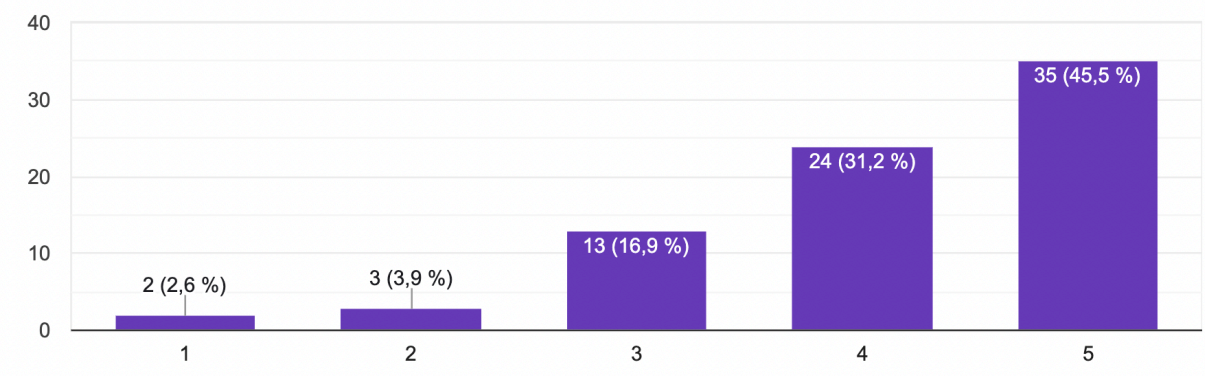

Figure 12. Are you satisfied with Spotify in terms of user behavior and consumption? (1 = not satisfied, 3 is both, 5 = very satisfied)

4.3 TikTok

Moving on to the next segment, respondents were given a question about how familiar they are with algorithms on TikTok. In summary, 14.3% (n = 11) were not familiar at all, 13% (n = 10) were less familiar, 16.9% (n = 13) answered more or less familiar, 33.8% (n = 26) were more likely familiar, and 22.1% (n = 17) were most familiar. Compared to Spotify's questionnaire, this result scored over average than Spotify algorithms where respondents were more familiar with TikTok algorithms than Spotify, considering these two platforms are different in terms of the user interface, providing different content and features, and different ways of use. 26 respondents with the highest percentage of 33.8% were more likely familiar, while 11 respondents with the lowest percentage of 14.3% were not familiar.

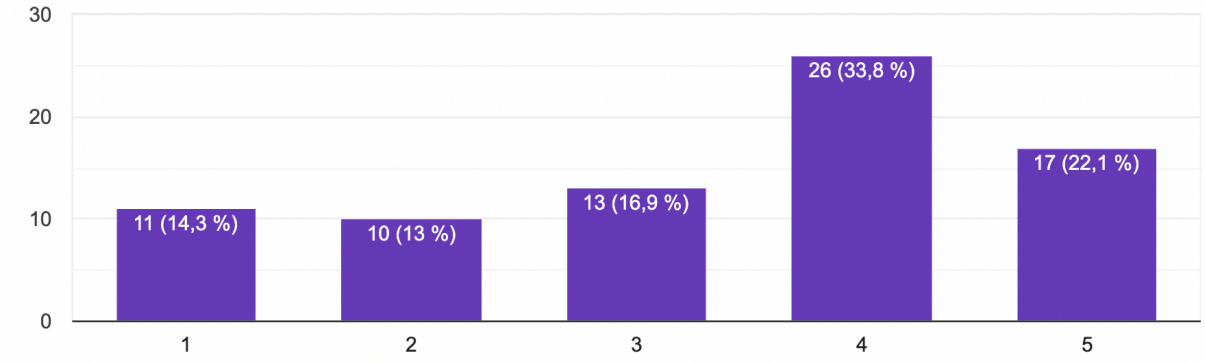

Figure 13. Familiarity with the algorithms on TikTok (1 = not familiar, 3 = more or less familiar, while 5 = most familiar)

4.3.1 Virality and the Guidance of Algorithms

Furthermore, respondents were given an optional question about virality, whether a user had experienced any kind of highly increased amount of views, likes, and comments after uploading video content where it may be referred to as viral or not. Since it was optional, 65 out of 77 respondents were provided with their answers. 27.7% (n = 18) answered yes, 43.1% (n = 28) answered no, and 29.2% (n = 19) were unsure.

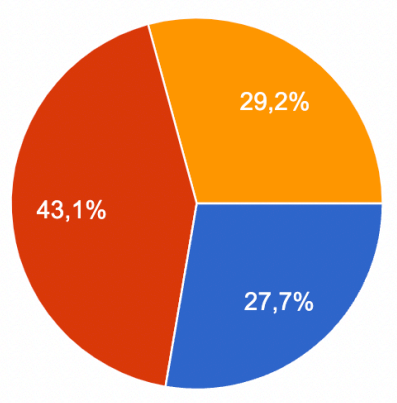

Figure 14. Virality on TikTok as a user consists of three pieces (blue = yes, red = no, orange = unsure)

Same as the previous one, but with the guidance of algorithms and how it may potentially occur this viral phenomenon, is based on user's liking, habits, and interests which also may impact other users. In this case, 39% of respondents (n = 30) said that it was most likely due to algorithms, 31.2% (n = 24) think it could go in both ways, 18.2% (n = 14) said more likely that algorithms caused this phenomenon, while 2.6% (n = 2) and 9,1% (n = 7) seems to think not likely.

4.3.2 Time Consumption

In terms of the time consumption on TikTok, the respondents were given a tick question and could choose several options. 79.2% (n = 61) spent their time watching funny videos, 31.2% (n = 24) spent their time discovering new sound and media content, 28.6% (n = 22) utilized TikTok for educational purposes, 11.7% (n = 7) using TikTok for creating videos, 70.1% (n = 54) used the platform for distraction from everyday life, and 75.3% (n = 58) explored the "For You" page.

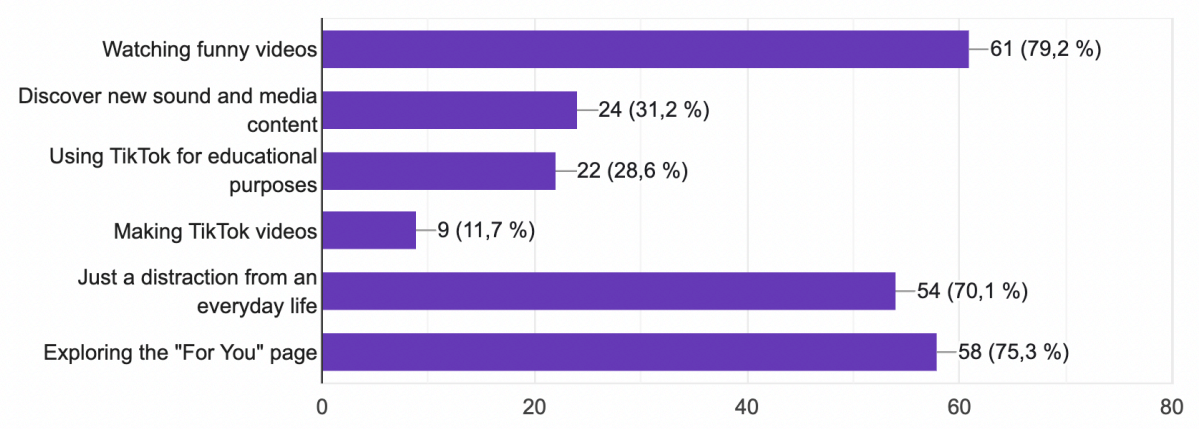

Figure 15. How consumers are spending their time on TikTok, whereas watching funny videos had a high percentage of 79,2%

4.3.3 Encounter of Malicious Content

Given the following Likert scale question from 1-5, whether the respondents had encountered any kind of malicious content which contained sexual, racist, and harmful content including misinformation videos that should not be on the platform. As a result, respondents with the highest percentage of 46.8% (n = 36) had encountered those problems before, while the lowest percentage of 6.5% (n = 5) never encountered them before. The remaining respondents where both 2 and 3 had answered equally with 11.7% (n = 9), and 23,4% (n = 18) on 4.

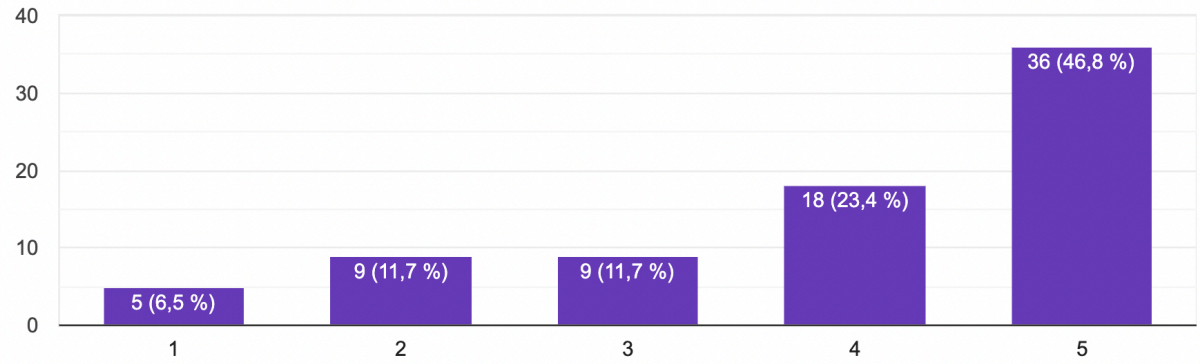

Figure 16. Encounter of malicious content (1 = never encountered, 3 is unsure, and 5 = have encountered)

4.3.4 Consumer Satisfaction with TikTok

The final part of this segment is how satisfied the respondents are with TikTok, in terms of user behavior and consumption. Overall, there is a significant result where respondents provided different values, however, the respondents of 44.2% (n = 34) were more or less satisfied with the platform. 19.5% (n = 15) were most satisfied, 16.9% (n = 13) were fairly satisfied, while 11.7% (n = 9) were less satisfied and 7.8% (n = 6) were not satisfied at all.

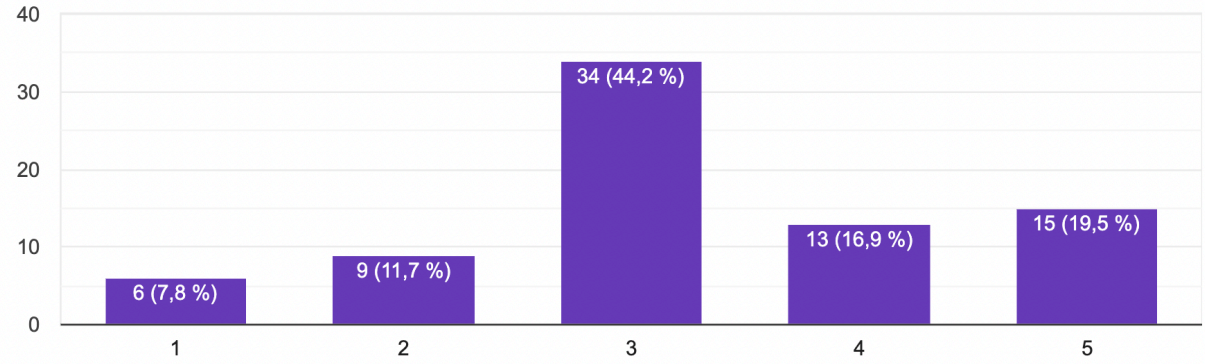

Figure 17. Consumer satisfaction with TikTok (1 = not satisfied, 3 = more or less satisfied, and 5 = most satisfied)

4.4 Algorithms and Data within Spotify and TikTok

At the end of the segment, this corresponded with respondents' assumption of algorithms and data, and the COVID-19 incident based on consumption within Spotify and TikTok. Thus, the following research question was given to respondents' algorithm affect you positively or negatively as a user. Not surprisingly, 50 respondents were more or less affected in both ways. On the other hand, only 8 respondents answered that algorithms affect positively in terms of discovering new music and media content, while only 1 respondent was being affected negatively by algorithms.

The next question they were given, was about if the respondents discover new music and content every time they utilize these platforms with the guidance of algorithms. It concluded with 18.2% (n = 14) that responded they do discover new music and content regularly, but 45.5% (n = 35) answered no – however not every time but often, while 36.4% (n = 28) said it depends on time consumption within these platforms.

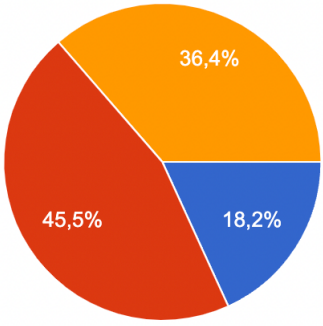

Figure 18. Do you discover new music and content every time you use Spotify and TikTok? (Red = no, not every time but often, blue = yes, regularly, orange = maybe, it depends on how much time I consume on the platform)

4.4.1 Surveillance

Moreover, in terms of collecting data, respondents were given a question about TikTok's awareness of surveillance. The results were significantly higher in the blue section – given that 62.3% (n = 48) were aware since they used it before, while only in the red section 9.1% (n = 7) were unaware, and in the orange section 28.6% (n = 22) does not concern about it since they were using it for entertainment purposes.

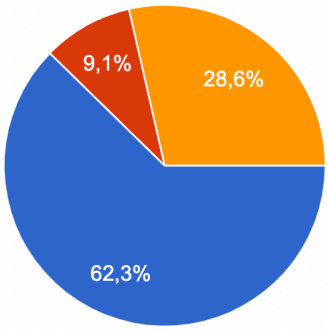

Figure 19. Surveillance of TikTok for collecting user's data (blue = yes, red = no, orange = no concern)

4.4.2 Accepting Cookies

Moving on to the next question, which was given to respondents about whether to accept cookies when visiting websites for enforcing data protection and data privacy or not accepting cookies. Therefore, there were four answers the respondents could provide, either a "yes", "no", "not every time", or "perhaps" from Figure 19 below. More specifically the "perhaps" part, was about accepting cookies without reading the terms and conditions. In summary, 40.3% (n = 31) responded "yes", 28.6% (n = 22) responded "perhaps", 27.3% (n = 21) responded "not every time", and only 3.9% (n = 3) responded a "no".

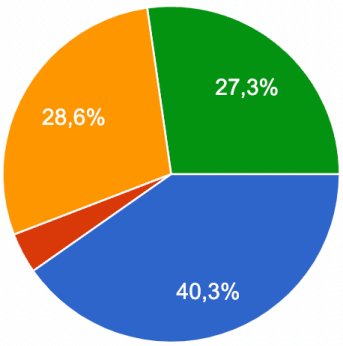

Figure 20. Accepting cookies (B = yes, R = no, O = perhaps, G = not every time)

4.4.3 GDPR

As expected, there were not many respondents that were not informed about the term GDPR, since it was not defined in the questionnaire due to unnecessary time consumption and may be unable for some of the respondents to provide accurate answers. Nevertheless, all of the respondents provided their answers. 49.4% (n = 38) were not informed of the term, where almost half of the respondents were not informed due to a lack of insight, however; 14.3% (n = 11) were well informed, 7.8% (n = 6) were fairly informed, 9.1% (n = 7) were more or less informed, and 19.5% (n = 15) were less informed. This will take into further discussion later in this thesis.

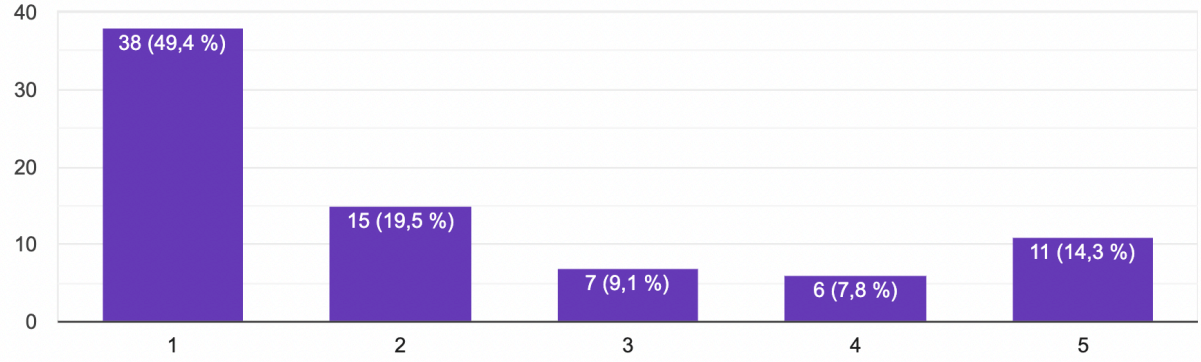

Figure 21. GDPR (1 = not informed, 3 = more or less informed, and 5 = most informed)

4.4.4 Platform Consumption Due to the Impact of COVID-19

In the end, the survey asked respondents about the impact of COVID-19 on their consumption of Spotify and TikTok, both during the pandemic and post-COVID-19. During the pandemic, 74% (n = 57) reported a significant increase in their consumption, 3.9% (n = 3) reported no increase, and 22.1% (n = 17) reported the same level of consumption as before the pandemic. After the pandemic, 32.5% (n = 25) reported awareness of increased consumption, 22.1% (n = 17) reported a moderate increase, 26% (n = 20) reported a slight increase or no change, 10.4% (n = 8) reported a decrease, and 9.1% (n = 7) was not aware of any change in their consumption.

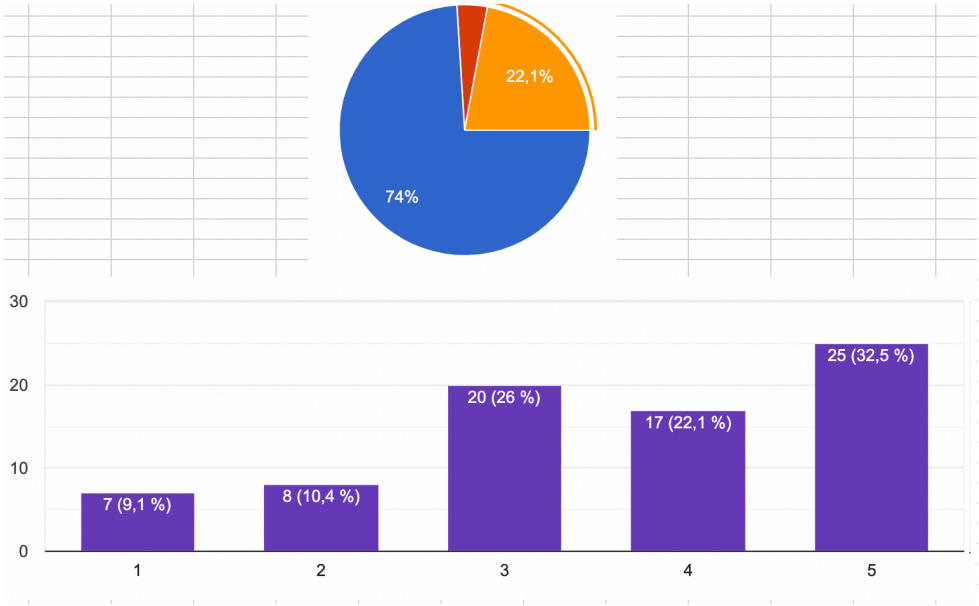

Figure 22. Consumption on Spotify and TikTok during and after COVID-19

One of the survey questions, number 17, pertains to the possibility of TikTok introducing a subscription feature in the near future. The majority of respondents, 32.5% (n = 25), believe that the platform will indeed launch such a feature, whereas only a small proportion of 7.8% (n = 6) think it will not be implemented, and 24.7% (n = 19) were unsure whether or not the platform will introduce a subscription tier. It is worth noting that this question is not relevant to this thesis, as the Resso music app is not the main focus and is only available in three countries, excluding Norway. This will have a relevance when the music app is available globally and may or may not be one of the new music industry. As a result, the discussion will solely focus on TikTok, which is the main platform.

5. Discussion

Finally, in this chapter, the results are summarized and then discussed against the selected theory of the thesis. The goal of this study is to discuss the use of methods and materials for this investigation of the following hypotheses. Thus, the findings that are gathered from the survey will be further discussed.

5.1 The Role of Music Subscription

Music subscription services, such as Spotify, have played a significant role in promoting substantially through the introduction of new features that serve specific purposes, both in terms of benefiting the business model of the service and enhancing the diversity and identity of music offered to consumers. According to our findings, which involved surveying 76 respondents in this case, the majority of users (76 out of 77) were found to utilize the premium version of Spotify, while only a small minority (1 out of 77) utilized the free tier. There are several reasons that some users utilize the free tier is because:

1. High cost - some users may not be willing or able to pay for it
2. Not every piece of music is available on Spotify, such as unofficial remixes/mashups
3. Lack of features
4. Temporary use (free trial of 30 days)
5. Alternative options (using other MSS or streaming services)

In order to maintain the balance between the free and premium tiers, it is important for the features offered by these services to be well-established and effective to minimize user dissatisfaction. As the number of subscribers continues to increase and the service expands through the integration of social and discovery tools on various devices, the importance of maintaining a strong feature set becomes even more crucial. The primary objective of Spotify's business model is to attract new users while maintaining existing users. Referring to Fosina: "there's going to be a leveling of free and a leveling of paid, and Spotify is going to keep a foot in each camp as they make that transition to going public" (Wang, 2022).[9]

[8] See chapter 2.1.1

Our findings found that respondents were satisfied with Spotify in terms of user behavior and consumption, citing the high-quality sound and easy discovery of new music through personalized and editorial playlists as key factors in their subscription and also other intermediaries.

Overall, Spotify allows users to create and share customized playlists with others, providing access to a library of music, which also aligns with the findings from Hagen (2015). As global music subscription is expected to continue to grow significantly in the coming years, with music subscriptions becoming a commodity for many subscribers. These results align with the findings of previous studies by (Colbjørnsen, 2020; Wikström, 2020; Eriksson et al., 2019; Papies & Wlömert, 2015; CISAC, 2022; Wang, 2022).

5.2 Spotify vs TikTok: The Algorithmic Black Box

The findings from the survey that were collected: 19 respondents were not acquainted with how algorithms work on Spotify, 20 respondents were more or less acquainted, and only 7 respondents were most acquainted. However, most respondents did not consider thinking about how the algorithms function while listening to music, as it was not a concern for them.

On the other hand, a majority of respondents believed that algorithms made it easier to discover new music based on user preferences. Among the respondents, the highest percentage 72.7% (n = 56) discovered new music through personalized playlists such as Discovery Weekly and Release Radar, while 53.2% (n = 41) discovered it through editorial playlists. Additionally, 61% (n = 47) discovered new music through TikTok, 62.3% (n = 48) discovered it through a friend, and 55.8% (n = 43) discovered it through social media.

It is worth noting that a higher number of respondents discovered new music through personalized playlists compared to editorial playlists – which is a 19.2% difference. Still, respondents also discovered new music through other intermediaries such as social media platforms (e.g., TikTok, Facebook, Instagram Reels) or via friends, which could suggest new music was not necessarily discovered on Spotify.

Furthermore, 64.9% (n = 50) of respondents felt that algorithms affected them in both ways as users, while 1.3% (n = 1) felt no effect, and 10.4% (n = 8) felt a positive effect. It concluded that the majority of respondents were not significantly affected by algorithms in terms of discovering new music and media content.

Algorithms that are utilized by Spotify and TikTok, use personalization to establish tailored recommendations for users, taking into account factors such as spatial data (location), temporal data (day of the week, season), and possibly even weather conditions. These personalized recommendations, such as Discovery Weekly and Release Radar on Spotify, are based on a collaborative filtering model that compares the music tastes of similar users and their shared consumption habits (Sanchez, 2018; Eriksson et al., 2019, Carregha, 2020).

Similar to TikTok algorithms, but with videos rather than songs where the platform is primarily focused on short-form video content, music still has an important role. As Beer (2016) notes, the algorithm can make decisions with or without human intervention, which is at the center of discussions about their potential power. Users can also discover new music by following other users who share music that they like, or by using hashtags related to specific genres or artists.

Pagano's (2016) statement within this context is accurate, in that overthrowing the assumption of personalization in recommender systems, involves recommendations for specific individuals. It involves specific changes for specific individuals that serves for a purpose within utilization. For this particular context, Barata & Coelho's (2021) definition of personalization describes "a process that changes the functionality, interface, information access, and content or distinctiveness of a system to increase its relevance to an individual or a category of individuals". In this case, consumers like to collect, stockpile, and enjoy music listening in these formats where users collect lists rather than objects, and those lists contribute a form of expressing users' feelings. To execute this, it needs to personalize user's collection of lists based on content they like, and therefore creating an expression within recommendations in that regard.

Furthermore, in TikTok's case, those lists contain videos that they liked before and can stockpile more fashionably for creating a customized playlist of videos. Chew (2023)

explained that the recommendation algorithm is just math, but simplifies the user's perspective and lives based on user behavior and what content they liked. This also corresponds to Prey (2017), Beer (2016), and Hagen's findings (2015).

However, as Wikström (2020) argued, playlists within recommendation algorithms could have positive and negative effects, but it is important to consider the context in which they are used. In the MSS case, algorithms need to be refined and updated to reflect dynamic user interests and provide a diverse range of recommendations. The playlists itself could be considered as a content – which is not different from other platforms such as TikTok where the user have the ability to like, creating a playlist of videos and storing them in one unit.

It is now focused on content, and those content can contain anything. In order to distribute content and generating from it, it needs to have revenue from different sources of income, such as streaming, data collection, attracting both existing and non-existing customers to sites or pages for new sounds and media content, etc. Our findings align with this finding and the likes of Colbjørnsen (2022), Negus (2015), Esiefarienrhe & Mogale (2022), and Papies & Wlömert (2015), who suggest that a diverse range of recommendations can lead to more positive user experiences. Additionally, according to CISAC's report (2022), MSS needs to consider the impact of algorithms on the broader music ecosystem, including issues such as artist discoverability and revenue distribution.

Furthermore, TikTok respondents have their collection of videos that they liked before, but some of them may or may have not liked the content that contains malicious content. Gaining access to that kind of content are unfortunately easy when the feed is being filled up with either sexual, racist or any misinformation content. According to our findings, TikTok respondents with the highest percentage of 46.8% (n = 36) had encountered those before.[10]

Although the platform is heavily used by teenagers between 13-19, they are crucially exposed when it comes to encountering harmful content, but that does not exclude the fact that from

[10] The question from our findings could have been either a «yes or no» question instead of a regular Likert scale question for more accurate data. However, this was interesting to see how they would rate from 1-5 in case they felt unsure rather than providing an unprecise answer.

the age of 18-33+ (also under 13) have experienced similar things before. It took less than 30 seconds to encounter this malicious content and a few hours for the algorithm to control users' feeds with offensive videos.[11]

Such content was listed as a "recommendation algorithm" since they confront those kinds of videos daily, hence the FYP will then be filled with such videos. Users selection of the content they observe by following personalization, whereas the flow of information by itself does not guide them in moments of disturbance. The disturbance itself could be either entertaining from watching the content or not. Thus, this kind of information does not allocate them with position and help in the pragmatic sense of engaging with algorithms daily. Its recommendation algorithm is not always recommended to users although it is based on users' preferences, the algorithm can be unpredictable as well. This corresponds with the previous findings from Schellewald (2022) and Masri & Weimann (2020).

On the other hand, Cardon (2018) stated that algorithmic power is primarily utilized when it enables and prevents users to do what they want with the content and to navigate the services as they like. Similar to Spotify's recommendation algorithms, where Dmour et al (2020) argued that the accusation of promoting a vague range of artists and genres, which could set limitations on music diversity that is recommended to users. Zajonc's observation of the mere exposure effect (1968) is relevant when it comes to this type of recommendation algorithm. A popular artist in a home country that seems to perform well on the home court may not however be suitable in another country – thus resulting in a niche of followers that perhaps appreciate the music in the same way. This also corresponds with Crabtree et al (2022).

Overall, companies like Spotify and TikTok must be more aware of the possibility of algorithm biases and take measures to attenuate them. This can include learning algorithms for diverse and representative data sets, as well as regularly analyzing the algorithms' performance to verify that they are not generating unfair or unequal results. Fortunately, the respondents took measures to minimize their activity effectiveness of encountering those biases and most of them were aware of it. Moreover, as biases could comprehend their use of

[11] See chapter 2.3.3

Spotify and TikTok, they were familiar with it and the concerns were not considered as crucial for their daily use.

5.3 Data Assumptions, Cookies, and Potential Concerns

The respondents were aware of their data was being collected in terms of personal information for utilizing these platforms. As mentioned, 62.3% (n = 48) were aware that TikTok is using surveillance to collect data, while only 9.1% (n = 7) were not aware, and 28.6% (n = 22) does not concern about the data being collected. Moreover, in terms of user behavior and consumption, taking into account that 44.2% (n = 34) were more or less satisfied, 19.5% (n = 15) were very satisfied, while only 7.8% (n = 6) were not satisfied.

In conclusion, a majority of respondents were aware of their consumption and data being collected beforehand by Spotify and TikTok, which does not affect heavily in use, regardless of how much they are utilizing these platforms. In other words, they do not concern more or less about the outcome of how their data is being collected, since they spend most of their time on daily use for specific purposes, such as listening to music on Spotify or watching content on TikTok. Mayer-Schönberger and Cukier (2013) correspond to these findings, the datafication process of tracking, quantifying, and analyzing user's everyday life. [12]

The state of dataveillance, proposed by Van Dijck (2014), noted that trust and belief were admissible as a preferred way of data monitoring citizens through social media. This also aligns with the findings of Zuboff (2019), who argues that platforms use surveillance to collect data on users that produce an accurate model of human beings, and they use this to see preferences and habits. In that case, Spotify and TikTok determine what content users see within, where the users lose the ability to shape their future because their data are controlled.

Additionally, big data had a significant impact on the music industry, particularly in the area of MSS such as Spotify and social media platforms like TikTok. These platforms generate a huge amount of data about their users, including information about what music they listen to, how often they listen, and how they discover new music. This data can be used to provide a

[12] See chapter 2.4.1

better understanding of the preferences and user behavior of music listening and to tailor recommendations and playlists to individual users (Aalto Capital, 2020; Dmour et al., 2020).

Regardless of how big data is generated vast amounts of data about users, this raises potential concerns about data privacy. Because Spotify and TikTok may use data analytics to track users' online behavior and to build detailed profiles of their interests, habits, and preferences. Hence, this data can be utilized for targeted advertising or other purposes, potentially without users' consent. To address these concerns, many countries have enacted laws and regulations to protect users' data privacy, such as the General Data Protection Regulation (GDPR) within the EU.

However, whether their data are being controlled more or less for disrupting privacy, it does not interfere with their daily use of platforms within and can use this data to control what content they liked before and therefore store the content systematically without any interference. On the other hand, their awareness of data privacy and data protection has been strengthened with the implementation of the GDPR. This corresponds to the findings from (Herrle & Hirsh, 2019; European Commission, 2022), and aligns with the concepts of datafication and dataveillance from van Djick (2014).

Furthermore, the respondents allow platforms to collect and sell their data without reading fully the terms and conditions. They commodified themselves and lost their autonomy, however, they may enjoy utilizing the platform as a source of empowerment (Lavin, 2006; Hormozi, 2005; Koch, 2022; Komnenic, 2022; Richards, 2021). Taking into account the "I Agree" and "I Disagree" cookies policy, several users have encountered and still encountering today regarding their use of the platforms but were unsure whether to agree or disagree. It was estimated that 40.3% (n = 31) responded "yes", 28.6% (n = 22) responded "perhaps", 27.3% (n = 21) responded "not every time", and only 3.9% (n = 3) responded "no". It means that those who agree will contribute to improving their: [13]

[13] As a user, clicking "I Agree" to accept cookies will improve the website and the app, which these four segments are most beneficial. Note that not all cookies policy is the same since they may vary, depending on the website or app you are visiting, but these segments are commonly utilized.

- Service improvement: improving the overall service by identifying bugs
- Research and analysis: collecting data from the user is beneficial for later use in research and analysis, which eventually leads to innovation and insights
- Targeted advertising: data can be utilized
- Optimized personalization

In other words, respondents can enhance their personalization of ads, storing their personal information without having to rewrite the whole process, and they contribute to improving the overall service of websites. Some respondents were nuanced in a certain amount of degree with accepting cookies and does not face severe consequences; however, some website hosts may prevent you to utilize their websites if you do not accept cookies. Without accepting cookies, the disadvantage you receive is that you may not be able to fully utilize them on certain websites. Moreover, whether negative attitudes forward cookies can be altered is a matter of debate.

5.4 Consumption during COVID-19 and post-COVID-19 pandemic

During COVID-19, around 74% (n = 57) reported a significant increase in their consumption, 3.9% (n = 3) reported no increase, and 22.1% (n = 17) reported the same level of consumption as before the pandemic. After the pandemic, 32.5% (n = 25) reported awareness of increased consumption, 22.1% (n = 17) noticed a moderate increase, 26% (n = 20) reported a slight increase or no change, 10.4% (n = 8) reported a reduction of increase, and 9.1% (n = 7) was not aware of any change in their consumption.

The reason why consumers were significantly higher during the pandemic, was due to lockdown and social distancing where the majority of the world went into lockdown with strict restrictions. People worked remotely from home and being sick was considered a major issue whether you had a regular cold or just a sneeze. On the other hand, this led families together and some individuals have not seen their beloved ones in years due to work matters or went overseas.

Luckily, one thing that does not prevent them is being on the Internet which the majority still had access, and therefore their consumption skyrocketed. Given the physical limitations,

seeing someone else while being sick was considered dangerous, or attending parties with a limited number of attendees; nightclubs and festivals were temporarily shutdown. Despite the nightlife being either closed temporarily or heavily restricted, the possibility of hosting a virtual concert online for free was a reality because of solidarity, and people were united as one.

Within music consumption, in terms of streaming and the usage of TikTok, musicians, and content creators were still able to produce their content during the pandemic whilst in isolation or quarantine. For instance, Taylor Swift released her album called "folklore" when the pandemic was still a new incident of happening event. Having said that Spotify's stock increased 27.1% from the start of the year to May 2020, and music consumption dropped by 12.5% after the WHOs pandemic declaration (Cho et al., 2022).

Although musicians were not able to perform at festivals during the pandemic, music streaming was still a big thing. Looking at the bright side, most musicians had their home studio to produce and wrote their music on their own, hence the distribution of music was not an issue, and music streaming was primarily their source of income. They were also being able to perform a digital concert via livestream. This also occurs regarding the content creators on TikTok, to produce content while making income. Ostrovsky & Chen (2020) conducted an analysis on TikTok related to COVID-19 as mentioned before, most of the users searched with the hashtags "COVID-19", "COVID19", and "coronavirus".

After the pandemic, with most things set to ease such as the cultural life and the restrictions have been repealed, musicians and content creators can now perform at festivals and collaboration with other content creators physically. In comparison, during the pandemic where 74% had a significant increase in consumption, and after the pandemic, 32.5% noticed an awareness of increased consumption. This was expected to happen because everything is available and open now (excluding some parts of China), most people can now go to work and their consumption such as Spotify and TikTok is not necessarily the same high amount as before during the pandemic.

Therefore, it seems that their consumption on those platforms is being reduced after the pandemic but still maintain their daily use. All of this corresponds to (Chen & Ostrovsky,

2020; Cho et al., 2022; Acar, Dyck, & Onderdijk, 2021; Burmester, Clement, Denk, & Kandziora, 2022; Morrow, Nordgård & Tschmuck, 2022).

6. Conclusion

In this last part of the segment, the current findings come from 77 respondents in total who conducted a quantitative survey who are/were students attending the University of Agder. The data has been collected for examination to answer two following research questions which inducted as a whole:

- **RQ1:** Can Spotify and TikTok users discover new music and content with the guidance of algorithms?
- **RQ2:** Does the algorithm affect the user behavior's data positively or negatively within these platforms?

It concluded that in fact, the hypothesis was valid. The majority of respondents agreed that it is indeed possible to discover new music and content with the guidance of algorithms and that algorithms affect the user's data more or less positively and negatively within Spotify and TikTok. The findings for this research have surprisingly gone well, and every respondent provided their answer to each question with no hesitation.

Observing the unknown of how recommendation algorithm functions and what impact it has on our daily life using those platforms, could be more or less satisfying. To deep-dive into a sort of void – but has no end of discovery in terms of user behavior and preferences, and one way or another, it could be either a positive or negative experience based on consumption. Consumers have unlimited amount of time to consume on the Internet, and several of them are spending their time on social media and streaming services, such as TikTok and Spotify. Those consumers have their own agenda on content; their user behavior within these platforms are determined on recommendation algorithm based on their personalization.

Although the recommendation algorithm does not always recommend your interests, it could recommend to someone within your range of interests. With some AI assistance, we can discover new things all the time and let the algorithms do the work – it might be either good content or bad content. Regardless of biases with the algorithm, whether malicious content is being shown on different platforms, some biases will be on those platforms without a takedown. Every target group of consumers must deal with that kind of stuff that they would

not want to be there, and some content that seems inappropriate will get access to post it online. Therefore, the user data could be determined by algorithms either positively or negatively.

In terms of further research, which is to deep-dive into the usage of AI utilizing the existing and non-existent knowledge of AI in music streaming and how it would impact the music industry. In this modern day, we have advanced a lot further with technologies such as AI, machine learning, and more connectivity across the globe for accessing information online. One way or another - there is going to be a fun time but yet, scary at the same time when the future is near.

References

Acar, F., Dyck, E. V., & Onderdijk, K. E. (2021, May 28). *Impact of Lockdown Measures on Joint Music Making: Playing Online and Physically Together*. Retrieved from Pubmed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8193044/

Adolfsson, L., & Bonfré, E. (2020). *Competitiveness in Music Streaming*. Retrieved from Chalmers Open Digital Repository: https://odr.chalmers.se/server/api/core/bitstreams/54d1afd9-609e-437d-a9f5-16fe98561b9f/content

Aalto Capital. (2020, May). *Big Data: Transforming the Music Industry*. Retrieved from Aalto Capital: https://aaltocapital.com/wp-content/uploads/2020/05/Aalto-Capital-Big-Data-Research-Paper.pdf

Andalibi, N., Delmonaco, D., Eslami, M., & Karizat, N. (2021, October 18). *Algorithmic Folk Theories and Identity: How TikTok Users Co-Produce Knowledge of Identity and Engage in Algorithmic Resistance*. Retrieved from ACM Digital Library: https://dl.acm.org/doi/pdf/10.1145/3476046

Aasen, M. M. (2017, May). *Perceptions in the Music Industry*. Retrieved from Universitetet i Agder: https://uia.brage.unit.no/uia-xmlui/bitstream/handle/11250/2470620/Aasen%2C%20Martin%20M%C3%B8rch.pdf?sequence=1

Barata, M. L., & Coelho, P. S. (2021, August 13). *Music streaming services: understanding the drivers of customer purchase and intention to recommend*. Retrieved from PubMed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8379453/

Barr, K., Hesmondhalgh, D., Osborne, R., & Sun, H. (2021, September 23). *Music Creators' Earnings in the Digital Era*. Retrieved from Intellectual Property Office: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1020133/music-creators-earnings-report.pdf

Beer, D. (2016, August 8). *The social power of algorithms*. Retrieved from Information, Communication & Society: https://doi.org/10.1080/1369118X.2016.1216147

Bucher, T. (2012, April 8). *Want to be on the top? Algorithmic power and the threat of invisibility on Facebook*. Retrieved from New Media & Society: https://doi.org/10.1177/1461444812440159

Burmester, A., Clement, M., Denk, J., & Kandziora, M. (2022, May 13). *The impact of COVID-19 on music consumption and music spending*. Retrieved from PLoS ONE: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0267640

Cardon, D. (2018). *The power of algorithms*. Retrieved from Pouvoirs: https://www.cairn-int.info/article-E_POUV_164_0063--the-power-of-algorithms.htm

Carregha, T. (2020, June). *Disrupting the Disrupters: Algorithmic Inequality in Music Streaming*. Retrieved from Ravensbourne University London: https://www.ravensbourne.ac.uk/asset-bucket/prod/2020-10/Disrupting_the_Disrupters_MusicIndustry.pdf

Chen, J. R., & Ostrovsky, A. M. (2020, August 29). *TikTok and Its Role in COVID-19 Information Propagation*. Retrieved from Journal of Adolescent Health: https://www.jahonline.org/action/showPdf?pii=S1054-139X%2820%2930459-6

Chew, S. (2023, April 22). TikTok CEO Shou Chew on Its Future — and What Makes Its Algorithm Different | Live at TED2023 . (C. Anderson, Interviewer)

Cho, D., Hwang, Y., Sim, J., & Telang, R. (2022, January). *Frontiers: Virus Shook the Streaming Star: Estimating the COVID-19 Impact on Music Consumption*. Retrieved from Marketing Science: https://pubsonline.informs.org/doi/epdf/10.1287/mksc.2021.1321

CISAC. (2022, October). *Global Collections Report 2022*. Retrieved from CISAC: https://www.cisac.org/services/reports-and-research/global-collections-report-2022

Citkowicz, M., Horton, R. S., Lauber, E. A., Montoya, R. M., & Vevea, J. L. (2017, March 6). *A Re-Examination of the Mere Exposure Effect: The Influence of Repeated Exposure on Recognition, Familiarity, and Liking*. Retrieved from APA: https://psycnet.apa.org/fulltext/2017-10109-001.pdf

Colbjørnsen, T. (2020, November). *The streaming network: Conceptualizing distribution economy, technology, and power in streaming media services*. Retrieved from Convergence. The International Journal of Research into New Media Technologies: https://doi.org/10.1177%2F1354856520966911

Crabtree, V., Hunter, J., McQuillan, S., Turnbull, D., & Zhang, S. (2022, August 19). *Exploring Popularity Bias in Music Recommendation Models and Commercial Streaming Services*. Retrieved from Cornell University: https://arxiv.org/pdf/2208.09517.pdf

Day, L., Dias, A., McGregor, J., Courners, F., & Hack, t. j. (2021, July 25). *The TikTok spiral*. Retrieved from ABC News: https://www.abc.net.au/news/2021-07-26/tiktok-algorithm-dangerous-eating-disorder-content-censorship/100277134

Dequan, W., & Omar, B. (2022, October 9). *Watch, Share or Create: The Influence of Personality Traits and User Motivation on TikTok Mobile Video Usage*. Retrieved from LearnTechLib: http://www.learntechlib.org/p/216454/

Dmour, N. A., Durrani, U. K., & Hujran, O. A. (2020, January). *Big Data and its Effect on the Music Industry*. Retrieved from Researchgate: https://www.researchgate.net/publication/340715777_Big_Data_and_its_Effect_on_the_Music_Industry

Eriksson, M., Fleischer, R., Johansson, A., Snickars, P., & Vonderau, P. (2019). *Spotify Teardown: Inside the Black Box of Streaming Music*. Cambridge, Massachusetts, USA: The MIT Press.

Esiefarienrhe, M., & Mogale, H. (2022, March 21). *Optimizing Recommendation Algorithms Using Self-Similarity Matrices for Music Streaming Services*. Retrieved from Researchgate: https://www.researchgate.net/publication/354243866_Optimizing_Recommendation_Algorithms_Using_Self-Similarity_Matrices_for_Music_Streaming_Services

European Commission. (2022). *Understanding the General Data Protection Regulation*. Retrieved from European Commission: http://euro.ecom.cmu.edu/program/law/08-732/Privacy/understanding-the-gdpr.pdf

Evans, M., Kaufman, G., Klug, D., & Qin, Y. (2021, June). *Trick and Please. A Mixed-Method Study On User Assumptions About the TikTok Algorithm*. Retrieved from ACM: https://dl.acm.org/doi/pdf/10.1145/3447535.3462512

Greenberg, D. M., & Rentfrow, P. J. (2017, July 31). *Music and big data: a new frontier*. Retrieved from Elsevier: https://doi.org/10.1016/j.cobeha.2017.07.007

Greve, G. (2023, April 15). Gunnar Greve | Alan Walker, Oppveksten, Familien, Narkodommen, Julie Bergan, Hans Zimmer, Vinni, AI. (W. W. Uncut, Interviewer)

Gurbaxani, A., Irawan, I., & Miranda, B. (2022, November 16). *What's It Like Using TikTok's Music-Streaming App?* Retrieved from Billboard: https://www.billboard.com/pro/tiktok-music-streaming-app-resso-what-like-using/

Hagen, A. N. (2015, March 13). *The Playlist Experience: Personal Playlists in Music Streaming Services*. Retrieved from Academia:

https://www.academia.edu/11398199/The_Playlist_Experience_Personal_Playlists_in_Music_Streaming_Services

Hagen, A. N., & Maasø, A. (2019, December 11). *Metrics and decision-making in music streaming*. Retrieved from Popular Communication: https://doi.org/10.1080/15405702.2019.1701675

Herrle, J., & Hirsh, J. (2019, July 9). *The Peril and Potential of the GDPR*. Retrieved from CIGI: https://www.cigionline.org/articles/peril-and-potential-gdpr/?utm_source=google_ads&utm_medium=grant&gclid=CjwKCAjwqJSaBhBUEiwAg5W9p_rxUsCYZUlZJjug82NKJDk3ynH-VatxeRhq_rbZxPFUvE1NTYCSIhoCeYcQAvD_BwE

Hormozi, A. M. (2005, Jan/Feb). *Cookies and privacy*. Retrieved from Information Systems Security: https://www.proquest.com/docview/229516983?pq-origsite=gscholar&fromopenview=true

Iqbal, M. (2022, August 19). *TikTok Revenue and Usage Statistics (2022)*. Retrieved from Business of Apps: https://www.businessofapps.com/data/tik-tok-statistics/

Iqbar, M. (2022, September 6). *Spotify Revenue and Usage Statistics (2022)* . Retrieved from Business of Apps: https://www.businessofapps.com/data/spotify-statistics/

Kim, R. Y. (2020, April 23). *The Impact of COVID-19 on Consumers: Preparing for Digital Sales*. Retrieved from IEEE Engineering Management Review: https://doi.org/10.1109/EMR.2020.2990115

Kjus, Y. (2016, March 14). *Musical Exploration via Streaming Services: The Norwegian Experience* . Retrieved from Popular Communication: https://www.academia.edu/19798348/Musical_Exploration_via_Streaming_Services_The_Norwegian_Experience_Popular_Communication_?email_work_card=view-paper

Koch, R. (2022). *Cookies, the GDPR, and the ePrivacy Directive*. Retrieved from GDPR: https://gdpr.eu/cookies/

Komnenic, M. (2022, January 14). *The Different Types of Internet Cookies Explained* . Retrieved from Termly: https://termly.io/resources/articles/types-of-internet-cookies/

Kumar, V. (2014, May). *Making "Freemium" Work*. Retrieved from Harvard Business Review: https://hbr.org/2014/05/making-freemium-work

Lavin, M. (2006, October 24). *Cookies: What do consumers know and what can they learn?* Retrieved from Journal of Targeting, Measurement and Analysis of Marketing: https://doi.org/10.1057/palgrave.jt.5740188

Liu, Y., & Zhang, M. (2022, September 6). *A commentary of TikTok recommendation algorithms in MIT Technology Review 2021*. Retrieved from Frontiers in Psychology: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.932805/full

Madathil, M. (2017, July 5). *Music Recommendation System Spotify - Collaborative Filtering*. Retrieved from Umeå University: https://hpac.cs.umu.se/teaching/sem-mus-17/Reports/Madathil.pdf

Masri, N., & Weimann, G. (2020, June 19). *Research Note: Spreading Hate on TikTok*. Retrieved from Taylor Francis Online: https://www.tandfonline.com/doi/full/10.1080/1057610X.2020.1780027?scroll=top&needAccess=true

Morris, J. W., & Powers, D. (2015). *Control, curation and musical experience in streaming music services*. Retrieved January 2023, from Creative Industries Journal: http://dx.doi.org/10.1080/17510694.2015.1090222

Morrow, G., Nordgård, D., & Tschmuck, P. (2022). Rethinking the Music Business: Music Contexts, Rights, Data, and COVID-19. In G. Musgrave , *'Losing Work, Losing Purpose': Representations of Musicians' Mental Health in the Time of COVID-19* (pp. 12-13). Cham, Switzerland: Springer.

Negus, K. (2015). *Digital divisions and the changing cultures of the music industries (or, the ironies of the artefact and invisibility)*. Retrieved from Journal of Business Anthropology: https://rauli.cbs.dk/index.php/jba/article/view/4793/5224

Newman, T. (2021, October 14). *How Spotify personalizes music according to Spotify's Vice President of Personalization*. Retrieved from RouteNote: https://routenote.com/blog/how-spotify-personalizes-music/

Nguyen, H. (2021, August 13). *Global: How consumers respond to cookies disclosures*. Retrieved from YouGov: https://business.yougov.com/content/37531-global-cookies-disclosures-behavior-survey

Papies, D., & Wlömert, N. (2015, December 1). *On-demand streaming services and music industry revenues - Insights from Spotify's market entry*. Retrieved September 2022, from Sciencedirect:

https://www.sciencedirect.com/science/article/abs/pii/S0167811615001226?via%3Dihub

Park, J. S., & Sandhu, R. (2004, July-Aug). *Secure Cookies on the Web*. Retrieved from IEEE Internet Computing: https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=865085

Parliament UK. (2021, July 15). *The music streaming market*. Retrieved from Parliament UK: https://publications.parliament.uk/pa/cm5802/cmselect/cmcumeds/50/5008.htm#_idTextAnchor053

Pathak, A. (2021, August 14). *Dissecting Social Media and TikTok for Children and Young Adults*. Retrieved from OsloMet: https://oda.oslomet.no/oda-xmlui/bitstream/handle/11250/2832345/pathak-acit2021.pdf?sequence=1&isAllowed=y

Prey, R. (2017, November 30). *Nothing personal: algorithmic individuation on music streaming platforms* . Retrieved from Sage Journals: https://journals.sagepub.com/doi/10.1177/0163443717745147

Prey, R., Valle, M. E., & Zwermer, L. (2020, May 22). *Platform pop: disentangling Spotify's intermediary role in the music industry*. Retrieved from Taylor Francis Online: https://www.tandfonline.com/doi/pdf/10.1080/1369118X.2020.1761859?needAccess=true

Razlogova, E. (2020, February 8). Provincializing Spotify: Radio, algorithms and conviviality. Montreal, Canada.

Richards, A. (2021, May 17). *TikTok: The Darkside of Surveillance*. Retrieved from Leeds Beckett University: https://ojs.leedsbeckett.ac.uk/index.php/SOC/article/view/4614

Rosenzweig, B. (2022, August 1). *TikTok May Have a Music App in the Works* . Retrieved from CNET: https://www.cnet.com/tech/services-and-software/a-tiktok-music-app-may-be-in-the-works/

Sanchez, J. (2018, May 7). *Algorithms and Curated Playlist Effect on Music Streaming Satisfaction*. Retrieved from TCU Digital Repository: https://repository.tcu.edu/bitstream/handle/116099117/22417/Sanchez__Johny-Honors_Project.pdf?sequence=1&isAllowed=y

Schellewald, A. (2022, February 15). *Theorizing "Stories About Algorithms" as a Mechanism in the Formation and Maintenance of Algorithmic Imaginaries*. Retrieved from Sage Journals: https://journals.sagepub.com/doi/full/10.1177/20563051221077025

Spotify. (2022). *Types of Spotify playlists*. Retrieved from Spotify for Artists: https://artists.spotify.com/help/article/types-of-spotify-playlists

TikTok. (2022). *About TikTok*. Retrieved from TikTok: https://www.tiktok.com/about

TikTok. (2022, Februrary). *Community Guidelines*. Retrieved from TikTok: https://www.tiktok.com/community-guidelines?lang=en#31

van Djick, J. (2014, May 9). *Surveillance & Society*. Retrieved from Datafication, dataism and dataveillance: Big Data between scientific paradigm and ideology: http://dx.doi.org/10.24908/ss.v12i2.4776

Wall Street Journal. (2023, April 15). *Spotify Breaks Down the Mapping Tech Behind Its Algorithm | The Tech Behind | WSJ* . Retrieved from YouTube: https://www.youtube.com/watch?v=pGntmcy_HX8&ab_channel=WallStreetJournal

Wang, A. X. (2022, July 21). *Spotify's leadership is doubling down on an unprofitable strategy* . Retrieved from Quartz at Work: https://qz.com/work/1218831/spotify-is-doubling-down-on-an-unprofitable-strategy-as-it-prepares-to-go-public/

Wikström, P. (2020). *The Music Industry: Music in the Cloud* (Vol. III). Cambridge: Polity Press.

Zulkifli, A. (2022, June). *TikTok in 2022: Revisiting Data and Privacy*. Retrieved from Computer: https://doi.ieeecomputersociety.org/10.1109/MC.2022.3164226

Zulli, D. J., & Zulli, D. (2020, December 26). *Extending the Internet meme: Conceptualizing technological mimesis and imitation publics on the TikTok platform*. Retrieved from New Media & Society: https://doi.org/10.1177/1461444820983603

Attachments

All of the data was gathered from Google Survey:

https://docs.google.com/forms/d/1rPjZS6gwgVZpmOb5WYoDm0BsJa2p9IW-JX0ErV2ssHE/prefill