The Evolution of Music Consumption: How We Got Here

Written by Dann Albright
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Spend ten minutes walking down almost any street in the world, and you’ll see a familiar sight: a young person walking down the street with Apple’s iconic white earbuds firmly planted in their ears. They might be bobbing along to the beat, or they could be keeping their head down, just trying to get to work through the crowds.

The rise of the iPod, the music-playing mobile phone, and a number of streaming media platforms all point toward a single, simple idea: music is important. It’s important to people on an individual level, it’s important to the human race on a societal level, and it’s hugely influential to the state of technology. The devices we use to listen to music help shape the technological landscape of the day.

But how did we get here?

When did those white earbuds become synonymous with young people and their portable music player of choice, the ubiquitous iPod? Was the iPod the first MP3 player? How did people listen to music before the Walkman? And where did it all start? The answers to these questions tell us not only about the history of music consumption technology, but also about how people have related to music for the past 150 years.
Early Days: The Phonograph

Our story begins, as many do, with Thomas Edison. Before his invention of the phonograph in 1877, music listeners could only listen to their favorite songs when someone else was playing them, whether in a concert hall or at home. Music has been an important part of human culture since prehistoric times (some experts believe music to have emerged 30,000 to 60,000 years ago), but the phonograph completely revolutionized its consumption.

Before Edison’s invention (the second iteration of which is pictured above), some inventors had managed to record music onto physical media, but 1877 saw the first machine that could both record music and play it back. Sounds to be recorded were transmitted through a recording stylus, which would create indentations on a round phonograph cylinder, and a playback stylus could read the recording and play it back through a diaphragm and the iconic horn.
The phonograph cylinders themselves were interesting devices — Edison started with one that consisted of tinfoil wrapped around a metal cylinder. Almost a decade later, a group of researchers and engineers that included Alexander Graham Bell created a phonograph cylinder made of cardboard covered in wax that could be engraved with recordings.

Around the same time, Edison created an all-wax cylinder that could be shaved down to record new sounds (this cylinder could be considered the ultimate precursor to the CD-RW). And in 1889, pre-recorded cylinders hit the market. Over time, the wax used for the cylinders was hardened, increasing the number of possible playbacks from a dozen or so to around a hundred times.

In the 1890s, the transition to using flat-disc records began. The recording was etched onto a disc that would be recognizable even today as a record. Interestingly, the dominance of the record over the phonograph cylinder didn’t come down to audio fidelity: the main advantage of the disc record was that it could be more easily mass-produced. By creating a master stamp, a number of records could be stamped in a short period of time, whereas each phonograph cylinder had to be recorded individually, significantly slowing the process.

Discs were first released in a five-inch version, then in a seven-inch, a ten-inch, and finally a 12-inch version in 1903. Around this time, interest in double-sided records started to pick up, and Edison realized that the cylinder was dying. He shortly switched to the Edison Disc Record (seen below), a 1/4-inch-thick piece of shellac that could only be played on Edison Disc Phonographs.
Shellac, the standard material of the day, wouldn’t be replaced by vinyl, a lighter and more durable material, until after World War II. After a decrease in sales during the war, record sales got a big boost, with more and more families having phonographs with automatic record changers in their homes.

The transition to vinyl also coincided with the change of the industry standard from 78 rpm to 33 1/3 rpm, which allowed a much larger amount of music to be recorded on a single disc. A 10-inch, 78 rpm disc (the most popular size for a number of years) could only contain about three minutes of music, so long songs or collections were often split across a number of discs, each of which was contained in a sleeve that was bound into a book format with the other sleeves, leading to the term “record album.”

A 12-inch, vinyl, 33 rpm record, however, could contain around 20 minutes of music on each side, and this longer-playing format began to dominate the market (it retained the “record album” moniker, as well as gained the title “LP” for “long-playing”). 45 rpm records also increased in popularity after the war, with most containing a single song on each side, earning them the name “singles.” Extended-play (EP) 45s were also introduced, each of which could contain two songs on each side.

Beyond this point, the changes in record players were mainly in the hardware used to turn the disc and relay the sound — belt- and direct-drive turntables, balanced tone arms, better styli, and so on. These innovations continue today with brands like Gemini and Stanton. The now-discontinued Technics SL-1210 is on display at the London Science Museum and described as one of the pieces of technology that have shaped the world we live in.
Taking to the Air: Radio

Although radio technology had been around since the early 20th century, it wasn’t until later that music started to hit the airwaves. The early history of music radio is murky, but a college radio station in the San Jose area is purported to have broadcast music between 1912 and 1917, though it didn’t start broadcasting daily until later.

During World War I (as well as World War II), the US Congress suspended all amateur radio broadcasts, meaning that many stations went off the air permanently. But 1XE of Medford, Massachusetts, was broadcasting music in 1919, shortly after the end of the war, and in the following years, more music radio stations began to pop up.

Unfortunately, they met with some resistance: many people believed that radio should only be used for two-way communication, and a New York station was even shut down by a federal inspector who stated that “there is no place on the ether for entertainment.” If only he could see the means by which we transmit music today.

Commercially licensed stations started appearing around this time as well — Pittsburgh’s KDKA is arguably the first, with its inaugural broadcast of presidential election results in October 1920. After that, the popularity of radio exploded: between 1920 and 1930, a reported 60% of American families purchased radio receivers, and the number of families with radios more than doubled during the 30s, ushering in the golden age of radio (usually characterized as lasting from the 20s to the 50s).

In the early days, music wasn’t the only thing broadcast on the radio — in fact, a number of stations only started broadcasting music after they had been on the air for a time. News, sports scores, voting results, soap operas, lectures, weather reports, comedians, political commentaries, and stories could all be heard on the airwaves. Chicago’s KYW broadcast opera six days a week, and didn’t start broadcasting popular and classical music until the opera season was over and more programming was required.

1922 saw the first appearance of something that would change the future of music broadcasting: the first radio advertisement. One has to wonder how surprised the people at AT&T, the company who
paid for the ad, would be if they could see the future of advertising on Internet radio and streaming services. They probably had no idea what they were starting.

Before it was considered acceptable to advertise on the radio, companies would sponsor musical programs, which had names like Champion Spark Plug Hour, Acouston Hour, and King Biscuit Time. Classical music was often broadcast live, a practice that still survives on a very small scale today. Country music also became more popular during the 1920s and 1930s, with a number of popular country shows being broadcast.
During this time, the standard format for radio stations was the full-service format, which saw the station broadcasting not only music and other types of shows, but also news, weather reports, talk shows, and a wide variety of other things of interest to the local public. This could be mixed with a network broadcast, much like is done on public radio stations today.

The development of popular music is often attributed to the radio, and the rise of the top 40 stations in the early 50s has influenced how music radio operates even today. By allowing radio stations to run with less space, equipment, and staff than full-service stations, top 40 stations quickly became the norm, especially after higher-fidelity magnetic recording made it feasible to broadcast pre-recorded programs in the 1940s (before this, most radio shows were broadcast live for better sound quality).

Another significant development in radio technology also took place around the middle of the century: the invention of the transistor. After its invention in 1947, it was quickly integrated into radios, allowing them to be made smaller and portable, instead of the large, stationary ones typically associated with the golden age of radio. In the 60s and 70s, billions of these radios were built, making easily portable music a reality.

Taking It with You: The Tape

In 1958, RCA would change the future of home music consumption by introducing the RCA tape cartridge (pictured to the right of a later compact cassette below). Before this cartridge, magnetic tape wasn’t a realistic option for home use, as reel-to-reel players were too complicated for consumers, especially compared to record players, which had been the de facto standard for home listening for several decades.

This was also the first time that acceptably high-quality audio had been encoded onto a magnetic tape medium for home use. Although the RCA tape cartridge introduced the possibility of 60 minutes of high-quality home listening on magnetic tape, it wouldn’t prove to be a success — it disappeared from shelves by 1964, largely due to low sales of players caused by a hesitance on the part of retailers and hi-fi enthusiasts to adopt the technology.

A number of competing systems tried to gain market dominance through magnetic tapes, but it wasn’t until 1964 that home audio would unite around a new format: the 8-track tape. Bill Lear, of the Lear Jet Corporation, along with representatives from Ampex, Ford, General Motors, Motorola, and RCA worked together to improve the technology that had been previously developed for the 4-track tape, which itself had been an improvement on the 3-track model.
Other tape formats had already been available in the home market for a number of years, but the inclusion of 8-track players in many cars of the 60s and 70s led it to become the dominant format of the day, despite its initial 46-minute play-time format.

By the late 60s, all of Ford's cars were offered with an available 8-track player as an upgrade, and hundreds of tapes were released, with the catalogue soon rivaling that of vinyl. And while other 8-track formats came and went, the Lear tape held fast as the most dominant one. Although the reign of the 8-track was brief (it had been supplanted by Phillips' compact cassettes by the late 70s), it remains an iconic music storage method.

Once Phillips proved that their compact cassette tapes could carry high-fidelity musical content in the early 1970s, they began a quick rise to domination of the automobile music market. Their small size was a big count in their favor, as smaller tape decks in cars and homes were advantageous — even soldiers in Vietnam appreciated the smaller size and greater portability of the medium.

Once manufacturers started making smaller, portable tape decks, the cassette's place in music had been cemented. Portable stereos became more feasible than they had been when the 8-track was the standard format, and adoption by the automobile industry ensured a quick rise in popularity.
An innovation possibly even more important than the cassette itself, however, was released by Sony in 1979: the Walkman. The introduction of the tiny portable stereo tape player helped even more of the music-listening public accept tapes as a viable home and personal music medium.

The Walkman, originally released as the Sound-About in the US, the Stowaway in the UK, and the Freestyle in Sweden, fundamentally changed how people listened to music; no longer tied to large home record players or large, inconvenient portable tape decks, listeners could easily take their music with them wherever they went. And because the first Walkman included two headphone jacks, music could be enjoyed with a friend.

In 1983, cassettes outsold vinyl for the first time, largely thanks to the Walkman and similar devices from other manufacturers. Continued innovation brought AM/FM radios, bass boost, rechargeable batteries, and auto-reverse to the Walkman, which continued to present a sleek face throughout a large number of iterations throughout the 1980s and early 1990s.

The Walkman name is so iconic that it’s been used for a range of devices, from cassette players to CD players to video MP3 players, and is still in use today.
The Digital Age: Compact Disc

Although digital recording had been happening since the late 1960s, it wasn’t until the early 1980s that the first commercial compact discs (CDs) appeared. Although discs closely resembling the eventual format had been demonstrated by companies in the 70s, the format of the CD was standardized in 1980, making it much easier for manufacturers to get into the business.

Before the CD, magnetic tape data (or the track on a record) was read mechanically, with a sensor turning a magnetic or physical pattern into an electrical signal. The use of a laser to read the data encoded on the disc was a huge leap forward in audio technology — the laser was bounced off of the disc, and the reflections were read by a sensor which transmitted an electrical signal.

In 1981, ABBA's *The Visitors* became the first popular music album to be pressed to CD, which was quickly followed by the first album to be released on CD, Billy Joel's *52nd Street*. Since then, musical releases have almost always included a CD release, with the format dominating the market in the late 80s, through the 90s, and into the early 2000s.

Error correction was built into CDs from very early on, one of the factors contributing to the format’s popularity with audiophiles. Although diehard LP fans still praised vinyl (especially in America, where resistance to the CD was a bit more entrenched than in Europe), the ability for a CD player to dampen the effect of a scratch or fingerprint was a huge leap forward in audio technology.

And the skip protection introduced into later players would further enhance the listening experience by storing a few seconds of music ahead of time so that playback would continue uninterrupted in the event of a skip.

By the late 80s, CDs had exploded in popularity, with the cost of CD players coming down and an increasingly large number of artists converting their back catalogs to the new digital format. The 60-minute playtime of a CD combined with the high audio quality offered, as well as the reading laser's
resistance to interference by dust or other particles, made the CD the primary musical medium for the next decade, with home and portable players quickly being adopted by listeners.

Although the CD has remained relatively unchanged in its lifetime, there were a number of slight changes to the format through the years. In 1983, the first experiments with erasable discs were revealed, paving the way for the later CD-RW (re-writeable), which superseded the CD-R (recordable) in the mid-90s. The cost of both the CDs and recorders able to write to them fell quickly, making these discs, at least temporarily, ubiquitous.

CDs also made a big splash in the computer industry, with CD-ROMs (CD-read only memory) debuting in 1985. Further refinements led to the creation of the Video CD, Super Video CD, Photo CD, DVD, HD DVD, and Blu-Ray discs.

The CD's musical reign didn’t go unchallenged, though. In 1992, Sony announced the MiniDisc, a magneto-optical storage medium that combined the storage systems of magnetic tapes and optical CDs. Sony hoped that the smaller size and significantly better skip resistance would help the MiniDisc transcend the CD as the musical medium of the day, but it was not to be.
A few audiophiles criticized the near-CD-quality audio, and the MiniDisc also suffered from a lack of players and pre-recorded albums, the drastic fall of blank CD prices, and most notably, the emergence of MP3 music players.

Although the MiniDisc did have some advantages over CDs, it suffered from poor timing, with the solid-state revolution quickly making them obsolete. Sony stopped making MiniDisc Walkman players in 2011 and all other MiniDisc players in 2013, totally killing off the medium (though some diehards still defend it).

Electronic Music’s Teething Years: The First MP3s

The history of MP3 is a fascinating one. It began in 1982, when Karlheinz Brandenburg was an electrical engineering PhD student at Friedrich-Alexander University Erlangen-Nuremberg. His thesis advisor issued him a challenge: find a way to transmit music over digital phone lines.

1986 saw the first real progress on the project, when more advanced technology was used to separate sounds into three sections, or “layers,” each of which could be saved or discarded depending on its importance to the overall sound. Brandenburg and his colleagues took advantage of a bit of a psychoacoustic phenomenon called auditory masking to compress the file size of the recording.

Auditory masking is what happens when the human ear is unable to hear certain sounds; louder sounds or those with lower frequencies can mask other sounds, meaning that the obscured sounds can be discarded from a recording without a noticeable loss in quality. This led to the ability to encode files with decreased bitrates, resulting in smaller files that retained an acceptable amount of the quality of the original sound.

The Motion Picture Experts Group (MPEG), a group tasked to create worldwide standards in audio recording, was created by the International Standards Organization (ISO) in 1988. The standard that MPEG created included Layers I, II, and III, the latter giving the highest quality at low bitrates.

Work on digital encoding continued, but ran into problems, with voices being recorded in very low fidelity. After further experimentation with psychoacoustic models and data codecs — and a close call wherein the encoding simply stopped working two days before submission of the codec — MPEG-1 Audio Layer III was finalized in 1991.

MPEG-1 Audio Layer III (and MPEG-2 Audio Layer III, an improved format standardized in 1998) is a lossy audio data compression format, meaning that every time the digital file is uncompressed and recompressed, more information is lost. The compression algorithms for MP3 take advantage of
limitations in human hearing to discard sounds that are not well perceived — or not perceived at all — by the human ear, resulting in very small music files compared to more robust lossless algorithms.

As the technology advanced, the encoding algorithms became more complex, allowing for things like average and variable bitrate encoding, in which more complex parts of the audio are recorded at a higher bit rate than less complex ones, resulting in higher-quality sound.

After realizing that this new format could be of great use to the growing Internet, Brandenburg and MPEG decided on a file extension in 1995: .mp3. It was around this time that Brandenburg was asked a telling question by an English entrepreneur: "Do you know that this will destroy the music industry?"

Looking back on this conversation, it seems likely that neither of them had any idea to what degree this would be true. But it didn’t take long for it to become clear just how big of a shakeup this would be.

In the mid-90s, MP3 decoding software was cheap — WinAmp, one of the most widely downloaded Windows programs of the era, was free (though it went to a freemium model where extras could be paid for). But encoding software was expensive, and formed the center of the business model.

(If the image above makes you yearn for pre-iTunes days of digital music, try making a portable version of WinAmp for a USB drive!)

Unfortunately for Fraunhofer and the music industry at large, an Australian student bought professional-grade encoding software with a stolen credit card in 1997 and distributed the core of the software as freeware. Brandenburg told NPR that it was in 1997 that he “got the impression that the avalanche was rolling and no one could stop it anymore.”

The inevitable rise of peer-to-peer music sharing resulted in one of the most infamous companies of the Internet age: Napster. Although it was only around for two years, the invention of Shawn Fanning, John Fanning, and Sean Parker shook up the music world like no other piece of software before or since. Napster was a simple, free peer-to-peer (P2P) file-sharing service; it wasn’t the first, but its focus on MP3 sharing catapulted it to almost 25 million verified users in February of 2001.
Although it was used by a wide variety of people, Napster is often associated with college students of the day; a number of universities blocked the service from their networks, and those that didn’t reported huge amounts of traffic — according to one 2000 article, some administrators reported between 40 and 61 percent of the traffic from their college networks going to Napster.

Of course, this free distribution of music couldn’t last long before it was attacked by the music industry. The first big attack on Napster came from thrash gods Metallica in 2000: after they discovered that their single “I Disappear” had been leaked to Napster before it was released, and had even made it to radio, they filed a lawsuit against the service under the Digital Media Copyright Act. Dr. Dre quickly followed suit (no pun intended). The Recording Industry Association of America also filed a suit. As a result of these lawsuits, Napster shut down in 2001 and declared bankruptcy the following year.

Despite the attack and subsequent quick death of Napster, many other P2P file-sharing services sprung up. If you were in your late teens or twenties in the early 2000s, you almost certainly remember LimeWire, Kazaa, Madster, or Scour Exchange. It was not a good time for these services, and many of them were shut down with similar lawsuits.

Of course, P2P music sharing still exists today, with BitTorrent being one of the most popular formats in use — especially because of its decentralized format, which can’t easily be shut down. BitTorrent trackers, however, which help users find each other and the files they’re looking for, can and have been targeted by lawsuits and taken down.

By this point, MP3s had moved off of the computer and into listeners’ pockets. Different sources have different opinions what the first MP3 player was, but Audio Highway’s Listen Up MP3 player, released in 1996, is a good bet. The 1997 MPMa, released by Saehan Information Systems, followed close on its heels.
These were relatively rudimentary systems by today’s standards, holding six to twelve songs and displaying the current song on a small screen. The Diamond Rio, Archos Jukebox, Creative Nomad Jukebox, and a few others were released in the following years, but the market destroyer was yet to come: the Apple iPod, in 2001.

The first generation iPod was a monster, containing a 5 GB hard drive that held up to 1,000 songs and selling for $400 (interestingly, the first phone with MP3 capabilities, the Samsung SPH-M100, was launched the year before, in 2000). The mechanical scroll wheel and five-button layout became synonymous with MP3 players very quickly due to the iPod’s popularity; its small size helped catapult it to the forefront of the MP3 player scene.
Over the next 14 years, continuing through to today, the iPod has gone through a large number of iterations, and seeing a significant decrease in size and weight, the introduction of touch-control scroll wheels, color screens, and a huge jump in available storage; the final iPod Classic (as it was called) had 160 GB of storage, 32 times that of the original.

In the years after the release of the first iPod, we’d see the release of a number of other models, including the iPod Mini, iPod Shuffle, iPod Nano, and iPod Touch. Other significant MP3 players would be released during the reign of the iPod, but none have come close to eclipsing the market dominance of Apple’s sleek little player.

The Siri personal assistant, Retina display technology, cameras, video recording, voice control, Bluetooth, and Wi-Fi connectivity were all added over the years, continuing Apple’s history of innovation. In September 2012, Apple reported that 350 million iPods had been sold worldwide.

Of course, where goes the iPod, so goes iTunes. It’s no surprise that iTunes debuted in 2001 alongside the iPod as “the world’s best and easiest to use ‘jukebox’ software.” More important was the release in 2003 of iTunes 4, which included the iTunes Music Store, Apple’s entry into the music sales business.

The ability to purchase a song or an entire album with a single click was obviously very appealing to users, and has remained so — iTunes has been the single largest distributor of music in the United States since 2008, and the largest in the world since 2010, despite some backlash over digital rights management and a few legal disputes.

Despite the technological superiority and overall popularity of the MP3 format, the iTunes Store doesn’t use this encoding; the songs sold are now encoded in Advanced Audio coding (AAC) format, which was standardized in 1997 and intended to be the successor to MP3. With more advanced encoding, higher quality at similar bit rates, and more flexibility, AAC is a superior format. Although MP3 is still prevalent, AAC has more industry support, and will likely completely replace MP3 in the near future.
The Streaming Revolution: Pandora

Though the title of “first music streaming service” isn’t easy to bestow, Pandora easily takes the “biggest early music streaming service” label. Launched in 2005, it pioneered the style of music recommendation service that would grow to become one of the biggest trends in modern music.

Five years before Pandora became a reality, the Music Genome Project was founded in an attempt to “capture the essence of music at the most fundamental level.” Pandora is the “custodian” of this project, which assigns values for up to 450 musical characteristics per song, depending on the genre: 150 for rock and pop, 350 for rap, 400 for jazz, and up to 450 for other genres, such as world music and classical.

These characteristics include things like “unique instrumentation,” “mixed minor and major key tonality,” “hard rock roots,” “subtle use of strings,” “lots of cymbals,” “dirty organ riff,” “thin ambient synth textures,” “epic buildup / breakdown,” “melodic songwriting,” “groove based composition,” “highly synthetic sonority,” “tonal harmony,” and just about everything else you could possibly think of.

These characteristics are assigned by human analysts, about 25 of which are working at a given time, coding two to four songs per hour, for about 10,000 songs per month. This information is fed into an algorithm to allow a user the ability to listen to songs that are similar to a given song, album, or artist (or, in the case of iTunes Radio, an entire music library).

Serving as a discovery engine, this technology has introduced millions of listeners to thousands of bands across the world and opened up a huge range of previously unavailable listening experiences. Of course, there are some criticisms of Pandora’s recommendation engine, including a degree of homogeneity, especially after Pandora introduced the “thumbs-up / thumbs-down” rating system. Continued rating of songs would eventually create a very small pool in a particular channel that a user had created.

But this didn’t stop people from using the service — in April 2013, Pandora had 200 million users, and after their IPO in 2011, they were valued at $2.6 billion. Much of their revenue comes through ads...
placed on the service that listeners hear between songs, and is supplemented by an ad-free premium plan.

Pandora's rise to prominence wasn't easy; the idea of a service that allows listeners to hear music from tens of thousands of artists without buying a single album is an understandably controversial one. Pandora and other music streaming services have faced nearly constant battles over royalties paid to artists, usually with artists demanding higher royalties. With rights holders earning — at most — cents per play, it takes a very large number of plays through a streaming service for the artist or record label to make any money.

However, the degree to which artists suffer from lost album sales is debatable; Tim Westergren, founder of Pandora, stated in 2012 that a few artists are receiving payments of $1 million annually, with a couple pulling in closer to $3 million. He also said that 2,000 artists would receive payments of $10,000 or more, while 800 would receive $50,000 or more. With Pandora's reported earnings in the second quarter of 2012 alone hovering around $100 million, however, most artists still weren't happy.

The battle over royalties and online music streaming certainly wasn't limited to Pandora; Spotify, an increasingly popular online music streaming service, has faced its own difficulties with artists’ dissatisfaction with royalties—including a rather heavily satirized Taylor Swift.
Swift’s very public act of pulling her music from Spotify certainly helped the service gain exposure in the public eye — last year, a poll published by Fortune showed it as the fourth most-used streaming service in America, behind Pandora, iHeartRadio, and iTunes Radio. This poll showed about five times as many users listening to Pandora as it did Spotify, though this gap is likely to have closed a bit since then.

In December 2013, Spotify released data on how much rights holders were paid per play of their songs, with the amounts surprising many people with how low they were: on average, rights holders received between $0.006 and $0.0084 per play. That’s less than a cent per play, which means hundreds of thousands or millions of plays are required for any meaningful earnings. Pandora, according to one 2013 report, pays $0.0012 per play to record labels, and $0.0002 to artists, which means an artist earns $200 per 1 million plays. No matter how you figure it, that’s not very much.

Of course, there’s a lot at stake here. Artists deserve to be paid for their work, especially when it’s their music that’s bringing millions of listeners to Pandora, iHeartRadio, and other online streaming services that are making millions of dollars on the ads that they sell. Artists and record labels work hard, and the astronomical rise in popularity of streaming has put a big damper on CD sales.

Within the past few years, online streaming has surpassed digital music sales, adding to the worries that allowing listeners to access music for free (or very nearly free; a premium subscription to Spotify is only $10 per month) will destroy the music industry, as the unnamed English entrepreneur predicted to Brandenburg when he showed off the MP3. Whatever the reason, album sales are tanking, with totals hitting record low numbers, and online streaming is taking off.

Whether or not the increase in streaming can make up for the drop in album sales isn’t clear; a Complex article from earlier this year presented some figures suggesting that the money made from billions of song plays via online streaming may have helped the record industry break even in 2014, but they don’t provide a comprehensive picture. It’s a tough one to get.

It’s clear, however, that streaming services are doing well: not only are Pandora, iHeartRadio, iTunes Radio, Spotify, Google Play All Access, Rhapsody, Slacker, and Tuneln Radio prospering, but new names are entering the market as well.

YouTube is working on a premium streaming service, and the very loosely Dr. Dre-affiliated Beats Radio recently debuted. Jay-Z recently launched another service called Tidal. No matter what you have to say about listeners, artists, and the music industry, being in the streaming business is a good way to make money.
At the moment, it seems that the system is precariously balanced, with some artists appreciating the publicity that they’re getting from online streaming services, and others — as well as record labels and other industry members — not happy about the fractions of pennies that they’re making per play. Despite there being no clear alternative to this model, it doesn’t look likely to last long in its current incarnation; there are just too many people on both sides who are unhappy with it.

One group that’s very happy with it, however, is listeners. The ease with which users can access tens of millions of songs in a matter of seconds is extremely appealing to a wide variety of types of listeners, from the most casual to the most committed.

A shocking statistic that shows just how good online streaming is for listeners is that music piracy in Norway has actually gone down by an astonishing 80 percent since streaming became more popular. And if online streaming is better and easier than piracy, it’s clear that it’s good for listeners, probably to the point of being bad for everyone else.

Besides being able to quickly access a monumental amount of music, of course, the biggest advantage of this format is that it doesn’t require terabytes of hard drive space to store it all. Being able to stream it from the cloud and download a few albums at a time for mobile listening is very space efficient — this was not the case in the days of Napster and LimeWire, in which users had to download all of their music, which both took a long time and required a huge amount of space.
The Future

So if streaming loses the crown as the most widely used form of music listening, what will take its place? To put it simply, I have no idea. When I was pondering this question a few days ago, I thought that music technology could advance so drastically within the next five or ten years that we wouldn’t even be listening to artists anymore.

We’d plug ourselves into machines that would take our tastes and procedurally generate new music that would perfectly fit what we like in our music libraries, much like video games are using procedural generation. While some people are experimenting with procedural music, it doesn’t look like anyone has tried to take that next step into complete customization.

However, there are a few signs that I might not be too far off here. Janel Torkington, in an article on the future of music listening, points out that no matter how many tracks we have available on Spotify or Beats Radio, we still have to make decisions on what we want to listen to.

Which means that our current way of listening to music is actually harder than it is to listen to the radio, which is still strangely popular among Americans — 91 percent of Americans listened to AM/FM radio in 2013. This suggests that a lot of people are looking for not only music that they like, but an easy listening experience that allows them to simply consume and not create.

Which is why people like Paul Lamere are looking into “zero-UI” music players. These players would ideally require no interaction from the listener whatsoever — they would use a wide range of information made available to them (demographic information; Facebook and Twitter posts; music library information; details on which songs were playing when the user turned up the volume, skipped a track, or abandoned a listening session; the current activity the user is taking part in, from walking to working to working out) to generate a highly targeted playlist that not only works with the users’ taste, but also their context. While many of us music aficionados might be horrified by this idea, Lamere
makes a strong case for the fact that this sort of system would be perfect for the majority of music listeners.

Spotify has also looked into similar ideas — a Guardian article from last year reported that they were looking into ways to incorporate heart rate, motion, temperature, and sleep patterns to figure out what the listener is doing and what sort of music they might like to hear. It’s obvious that Spotify is serious about this, as they bought The Echo Nest, the company headed by Lamere. The Echo Nest is an innovative “musical intelligence platform” that powers many discovery engines and other recommendation applications. Just where their partnership with Spotify will lead is anybody’s guess, but it’s a safe bet that it will be pretty cool.

Then again, we’ve seen what happens when technology goes further and faster than we’re ready for: look at the advent of tiny cell phones, and how quickly we went back to full-size phones and even huge phablets. Look at how small earbuds got before we decided that the big, booming sound of a
pair of Sennheisers or Bose over-ears was better. Recommendation services may be the hot thing of the day, but I wouldn’t be surprised if we go back to the radio era, or even the mixtape era, before we progress further.

There’s something special about picking out an album that not only contains one of your favorite tracks, but has the perfect balance of up-tempo tracks and soulful melodies; that hits the sweet spot of combining builds-ups and breakdowns, catchy hooks and crushing riffs. The art of putting an album together is still alive and well, even if it’s a bit under appreciated at the moment. Its day very well may return.

**Conclusion**

The history of music consumption is a long one, and spans almost 150 years. The history of music, and music performance, is a lot longer, with some philosophers believing that music is one of the the defining characteristics that makes humans different from lower-order animals.

Music has played a role in how we celebrate, worship, communicate, design, and build for centuries, and it will likely remain one of the powerful tools in the human cognitive vocabulary. Music is a powerful thing, and the way in which we relate to it has changed as we have evolved and become more advanced as a species.

Of course, there have been some big changes; music has been affected by the way in which we consume it, and the way in which we consume music has been a strong defining force — the change from the gramophone to the tape, the advance from the CD to the MP3, have been notable technological paradigm shifts in human history.

The future of music consumption is a question mark at the moment — further algorithmic control looks likely, but the exact degree to which it will come to rule our listening experience remains unknown. And regression back to full control certainly isn’t out of the question. The only sure thing is
that music — in one form or another — will be with us forever, whether we go back to listening to vinyl on home players or we find a way to implant individualized algorithmic composers and players directly into our brains.

From the gramophone to the FM radio, from the Walkman to the MP3 player, from the anarchy of Napster to the algorithmic rule of Pandora, the systems through which we relate to music today only bear a passing resemblance to the ways we listened 100 years ago. And yet, we still listen. Whether music is part of what makes us human, an evolutionary quirk, an escape mechanism, or a distinctly advanced way of relating to our environment, it’s here to stay. And we’ll continue to innovate, challenge, and completely change the ways in which we consume it.

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