

Pandora Radio

Subjects: Computer Science, Information Systems

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Pandora Media Inc. (also known as Pandora Internet Radio or simply Pandora) is a music streaming and automated music recommendation internet radio service powered by the Music Genome Project. As of August 1, 2017, the service, operated by Pandora Media, Inc., is available only in the United States. The service plays songs that have similar musical traits. The user then provides positive or negative feedback (as thumbs up or thumbs down) for songs chosen by the service, and the feedback is taken into account in the subsequent selection of other songs to play. The service can be accessed either through a web browser or with its mobile app. Pandora is a freemium service; basic features are free with advertisements or limitations, while additional features, such as improved streaming quality, music downloads and offline channels are offered via paid subscriptions. On September 24, 2018, Sirius XM Holdings announced its intent to acquire Pandora for \$3.5 billion.

Keywords: music streaming ; music recommendation ; freemium

1. History

In 2000, Pandora Media Inc. began as Savage Beast Technologies, and was founded by Will Glaser, Jon Kraft and Tim Westergren.^{[1][2]} The idea was to create a separate, individualized radio station for each user, with music that the user prefers and without music that they do not prefer. The company quickly ran through its initial \$2 million in funding, running out of money by 2001. Founder Tim Westergren then convinced Pandora's 50 employees of the company to work for two years without pay.^[3]

Initially, the company pursued a transitional strategy of technology licensing to third parties including AOL, Best Buy, Barnes & Noble, and Tower Records. In 2004, the company returned to its initial vision of producing customized radio stations and changed its name to Pandora Media.^[4] The website began as a paid service but quickly changed to an advertising service to make it also available free for users.

In 2011, Pandora launched its IPO on the NYSE and is listed as 'P'.^[5] On March 7, 2013, Pandora chairman and chief executive Joseph J. Kennedy announced that he would leave the company after nine years.^[6] In April 2013, Pandora announced that their radio streaming service had passed 200 million users, about 70 million of whom were active monthly.^[7] By December 2013, Pandora was noted as accounting for 70 percent of all Internet radio listening in the United States.^[8]

On September 1, 2013, Pandora removed a 40-hour-per-month limitation for free mobile listening.^[9] In December 2013, iTunes was described as Pandora's "biggest existential threat".^[1]

In early 2015, Pandora removed lyrics from song pages but returned them by July. On April 16, 2015, song samples were officially removed. At around the same time, a new feature was introduced to give users the ability to receive notices about their favorite artists through the music player. They also redesigned the thumbs up/down feature to allow the listener to undo their action. By January 2015, songs played on Pandora had received more than 50 billion thumbs up from users.^[9]

In early 2017, Pandora revealed that 56 million of its 81 million active users subscribe to the *Today's Country* station and that country music accounted for more than 1.7 billion listening hours on the platform in 2016.^[10]

On July 31, 2017, Pandora discontinued services in Australia and New Zealand, citing a need to focus solely on the U.S. market only.^{[11][12]}

In September 2017, Roger Lynch became CEO; Lynch stated that he wanted to expand the service's focus on podcasts, with similar discovery features to those for music, as well as new monetization options.^[13]

On September 24, 2018, Sirius XM Holdings announced its intent to acquire Pandora for \$3.5 billion.^[14]

1.1. Acquisitions

On June 11, 2013, Pandora announced it would purchase FM radio station KXMZ in Rapid City, South Dakota.^{[15][16]} On October 7, 2015, Pandora announced it had acquired independent ticketing agency Ticketfly for \$450 million.^[17]

In November 2015, streaming music service Rdio, founded by Skype co-founders Janus Friis and Niklas Zennstroem, declared bankruptcy and sold its assets to Pandora for \$75 million in an all-cash deal.^[18] Pandora retained 100 Rdio employees, including Iain Morris and Rich Masio, who joined a growing licensing department in pursuit of direct licenses with labels and publishers.^[19]

In March 2018, Pandora announced it would acquire digital audio ad technology firm AdsWizz for \$145 million.^[20]

2. Features

2.1. Streaming

A station is set by specifying an artist or song, or a combination of multiple items of any kind in a single station. Listeners can tune into established genre stations, other users' stations or create their own stations based on their musical interests.^[21] Each track played can be responded to with favorable (thumbs up) or unfavorable (thumbs down) buttons, which determine if it should be played, and if similarly classified songs should be played in the station. A second negative response to the same artist will ban that artist from the selected station unless the user has marked the artist positively on another occasion or if that artist is listed under the station's variety. No response is applicable to musical attributes or to albums. An unfavorable response immediately stops play of the track. Clicking the thumbs down or skipping to the next song too many times in a row will result in a short ban of skips. Pandora also utilizes short advertisements between every couple of songs.

A menu is provided with options, such as "I'm tired of this song" (allowing a user to remove a song from the station temporarily, which counts as a skip), "Why was this song selected?" (allowing users to learn more about the composition of each song), "Move song to another station," "New station," and "Bookmark." A "Buy" button is located at the top of each song block. From there, listeners can click on links to purchase the song from iTunes or Amazon.

There is a setting in each member's account allowing the user to censor songs with explicit lyrics. The censoring option applies exclusively to song versions from albums with a Parental Advisory label, as other songs with censored versions will have that version played. An example is the song Jet Airliner by the Steve Miller Band, which had one word censored for radio play. With explicit lyrics off, that version will play, because the album did not have a PA label.

While listening, users are offered the ability to buy the songs or albums at various online retailers.^[21] More than 450 musical attributes are considered when selecting the next song. These 450 attributes are combined into larger groups called focus traits. There are 2,000 focus traits. Examples of these are rhythm syncopation, key tonality, vocal harmonies and displayed instrumental proficiency.

The service has two subscription plans: a free subscription supported by advertisements, and a fee-based subscription without advertisements. There are advertisements in Pandora Mobile for mobile phones and in the Pandora computer appliance. In October 2014, less than 5 percent of active listeners were paying subscribers.^[22] At the time of Pandora's IPO in 2011, Pandora had 800,000 tracks from 80,000 artists in its library and 80 million users.^[23] By November 2014, Pandora had approximately doubled its library size, topping 1.5 million songs.^[24] As of end of mid-year 2018, Pandora had 71.4 million active users.^[25]

In September 2016, Pandora announced additional features and subscription options, including a mid-level subscription service known as *Pandora Plus* that offers advertisement-free streaming, offline playback support using a prediction mechanism and more skips and replays. Users of the free advertisements-included service also were provided more skips and replays in exchange for watching an advertisement. Pandora also announced the launch of an on-demand service similar to competitors such as Apple Music and Spotify.^{[26][27]}

On March 13, 2017, Pandora launched *Pandora Premium*, a new service allowing users to listen to and create playlists of individual songs on demand. Pandora's suggestions engine suggests and recommends songs and albums, as well as generate playlists based on similar songs. Pandora also emphasized a use of machine learning and manual curation, and that it had filtered "karaoke tracks, knock-off covers and pet sounds (but not *Pet Sounds*) that slow down other services" from its library.^[28]

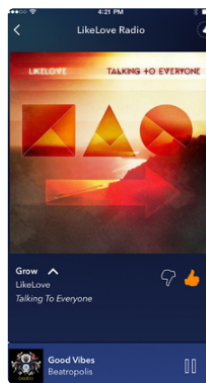
2.2. Limitations

To comply with the requirements and protections offered by the DMCA, Pandora serves users only in the United States, using IP addresses to block users from non-complying countries.^[29]

Rewind is not permitted. Until May 2009, six skips per station were allowed per hour, further limited to 72 skips every 24 hours. Giving a thumbs-down response, or a "don't play for a month" response count as skips. On May 21, 2009, the skip limit was altered such that it counts total skips from all stations with the limitation of twelve total skips every 24 hours. If a listener gives a song a thumbs-down or "don't play for a month" after the limit has been exceeded, the song will continue to play; it is only after the song has completed that it becomes subject to the listener's restrictions. Play of a single artist is limited, as Pandora provides similar music, not a play-on-demand service.

Initially, users with free accounts could listen to 40 hours of music a month, and could pay \$0.99 per month for unlimited streaming. In September 2011, Pandora removed the 40-hour listening limit.^[30] This 40-hour limit on free listening was re-introduced in March 2013 for mobile devices.^[31] However, this limit was removed once more on September of the same year.^[8]

2.3. Mobile Devices



Pandora iOS App. <https://handwiki.org/wiki/index.php?curid=1518401>

Pandora is available on iOS devices.^[32] It is ad-supported and retains the original skip limits. Pandora is also available on Android (for tablets and mobile phones)^[33], and BlackBerry 10 handsets via the Amazon app store.

The Pandora for BlackBerry OS (7.1 and earlier) application is limited to AT&T, Sprint, Verizon, T-Mobile, Boost Mobile, and U.S. Cellular carriers, but by visiting the Pandora website directly other BlackBerry users have been successful in downloading and using the application.^[34]

3. Technical Information

The Pandora media player is based on OpenLaszlo.^[35] Pandora can also be accessed through many media streaming devices such as Roku, Reciva-based radios (from companies like Grace Digital, Sanyo, and Sangean), Frontier Silicon-based connected audio systems, Slim Devices, Sonos,^[36] and HEOS by Denon.^[37] product(s). On July 11, 2008, Pandora launched a mobile version of their software for the Apple iPhone and iPod Touch through the iTunes App Store. Pandora is also available for Windows Phone, Windows 10, Android phones,^[38] BlackBerry platforms, HP webOS (used on the Palm Pre, Palm Pixi, Palm Pre 2, and HP Veer) . Pandora was the provider for MSN Radio until MSN discontinued their internet radio service on June 18, 2008.^[39] A modified version of Pandora has been made available for Sprint. Pandora is available on Comcast's X1/X2 cable TV products. A GNU/Linux-based application, called Pithos, which is available for accessing Pandora Radio, is available for most distributions via their repositories and is also available to build from source. SoundSpectrum's iOS-based visualizing application Tunr^[40] has native support for Pandora, but requires a ONE subscription.

With a subscription to Pandora's One service, Windows and Mac users can download a desktop application for Pandora that uses the Adobe Air without using a web browser to access Pandora. All the normal functionality is included such as thumbs up/down, skip, pause and access to all channels on a user's account.^[41]

4. Business Model

Pandora decided to be a consumer-oriented music discovery service, specifically a non-interactive radio station. In the three months that ended October 31, 2011, advertising comprised 88% of Pandora's total revenues;^[42] a figure of 80% was reported for this metric in December 2013.^[41] RPM (revenue per 1000s of hours) is determined based on CPMs (cost per thousand impressions). CPMs are largely dependent upon network effects and thus increase as a website scales and adds users. As such, Pandora's strategy in order to allow for widespread distribution was to offer a service unbundled from devices and transport. Pandora is currently working with system-on-chip manufacturers to embed its technologies on the chips they sell to consumer electronics manufacturers like Samsung, Sony, and Panasonic.^[43]

Pandora's cost structure is highly variable, with content acquisition costs representing roughly 50% of total costs.^[42] There are three main costs associated with content acquisition. First, SoundExchange collects content fees on behalf of labels or artists on the recording themselves. These are by far the largest content acquisition costs. Second, Pandora pays licensing fees to agencies such as BMI, ASCAP, or SESAC in order to compensate composers, songwriters and publishers. Lastly, Pandora also pays TiVo Corporation for song and artist information; this has recently been structured as a flat monthly fee.

High variable costs mean that Pandora does not have significant operating leverage, and in the next couple years might actually have negative operating leverage due to an unfavorable shift in product mix towards mobile. Pandora is currently estimated to monetize mobile hours at roughly one-ninth the rate of desktop hours.^[44] Since Pandora pays the same licensing cost per hour irrespective of the user's platform, the net contribution to earnings per mobile hour is even more skewed with respect to contribution to earnings from desktop hours. Mobile revenues will improve over time as Pandora shifts from relying on third-party ad networks to selling ad inventory internally at premium rates.

In January 2011, Pandora met with investment banks to consider a possible \$100 million IPO.^{[45][46]} The company filed with the SEC for a \$100mm IPO on February 11, 2011 and officially began trading on the New York Stock Exchange with ticker symbol "P" on June 15, 2011 at a price of \$16/share. This gave them a valuation of nearly \$2.6 billion.^[47]

Pandora announced \$80.8 million in total revenue for their first quarter of fiscal 2012, which was up 58% over their previous year Q1 results. Of the \$80.8 million, \$70.6 million came from advertising, while the other \$10.2 million came from subscription. In addition, Pandora has seen a 62% advertising revenue increase, and a 38% subscription revenue increase year-over-year.^[48] However, the vast majority of Pandora's users remain on the free, ad-supported model.

5. Royalties

In 2007, a federal panel agreed with a SoundExchange request and ordered a doubling of the per-song performance royalty that Web radio stations pay to performers and record companies. Under this scheme, internet radio would pay double the royalty paid by satellite radio.

Because of the passage of DMCA in 1998 that increased fees and asked for licensing guarantees, the Pandora service was only available in Australia, New Zealand and the *United States*,^{[49][50]} until service to Australia and New Zealand ceased on 1 August 2017 after "consideration of external factors".^[51] These rulings affect all U.S.-based Internet-based radio stations (terrestrial radio is not affected).

As of July 2008, Pandora was in talks with major music labels regarding royalty issues to allow a return to the European market. Costs remain a concern because of European royalty standards and a low demand for paid music services.^[52]

In 2008, the founder of Pandora stated that the company may be on the verge of collapse. Royalty fees account for a majority portion of Pandora's revenues. If an agreement between Pandora and SoundExchange had not been reached, it could have meant the end of Pandora. "We're losing money as it is," said Tim Westergren. "The moment we think this problem in Washington is not going to get solved, we have to pull the plug because all we're doing is wasting money."^[53]

On September 30, 2008, a bill was passed by the U.S. House and Senate to allow sites like Pandora to continue negotiations with SoundExchange into 2009.

On July 7, 2009, Pandora announced that an agreement had been reached regarding the royalty issue, which would significantly reduce the royalty rate, making it possible for Pandora to stay in business. Also announced was that free listening would be limited to 40 hours per month, but can be extended to unlimited for that month for *United States dollar* \$0.99. "The revised royalties are quite high," the company's blog notes, "higher in fact than any other form of radio".^[54] The extended listening fee differs from "upgrading", which also disables advertisements, increases the bitrate from 64 to 192 kbps, and provides a dedicated music player (as opposed to listening through browser). This service, known as

"Pandora One", costs \$36 and is billed annually.^[55] Pandora has since introduced an option to purchase Pandora One subscriptions on a monthly basis at a rate of \$3.99 per month.^[56] Also, in September 2013, Pandora began working with HitBliss to make Pandora One subscriptions available for HitBliss earned-payment.^[57]

With an update to the Pandora player in September 2011, the 40 hour cap was extended to 320 hours.^{[30][58]}

On November 22, 2011, Pandora reported its Q3 earnings. Royalty costs accounted for 50% of revenue, slightly better than expected. Its revenue, most of it from advertising, continues to rise at respectable rates. Not only has Pandora attracted more users but the average number of hours per user have also increased. Pandora now accounts for an estimated 4% of total US listening hours. As Pandora grows, it hopes to gain leverage on music labels and drive royalty costs down.^[59]

On December 9, 2011, the CEO of Spotify, Daniel Ek, announced Spotify Radio would offer an unlimited number of stations and unlimited skips. Though Pandora's usage is 70% mobile, the Spotify Radio app competes against Pandora's mobile market.^[60]

Pandora CEO Tim Westergren has supported The Internet Radio Fairness Act or IRFA (H.R. 6480/S. 3609), which would reduce the company's royalty payments to the performers by 80 percent.^[61]

On November 5, 2012, Pandora filed suit in federal district court against ASCAP over royalty fees.^[62] In the suit, the company sought to advocate for lower licensing fees on all the songs represented by the ASCAP's 435,000 members.^[63] On February 27, 2013, Pandora announced a 40-hour-per-month limit on free mobile listening. Pandora CEO Tim Westergren cited escalating royalty costs as the reason for the mobile cap.^[64]

In a ruling made public earlier this year, US District Judge Denise Cote ruled that Pandora's rate paid to ASCAP should remain the same, 1.85%. She cited (p. 97) "troubling coordination" between two of the biggest publishing companies (Sony and UMPG) and ASCAP that alludes to core antitrust concern in the industry.^[65]

After arguing that both ASCAP and BMI were showing bias towards international broadcasters who own terrestrial radio stations, Pandora announced on June 11, 2013 that it would attempt to acquire KXMZ, a radio station in South Dakota, under the presumption that doing so would allow it to access the same preferential licensing terms offered to services such as iHeartRadio (which is owned by iHeartMedia, Inc., itself America's largest radio broadcaster).^{[15][16]} The move was criticized by David Israelite, CEO of the National Music Publishers Association, who declared that Pandora was now "at war with songwriters," and had lost its credibility because it was resorting to "lawsuits and gimmicks" to make its point. However, a member of Public Knowledge praised the move, by stating that it was "a perfect example of the twisted incentives and strange results we get from a music licensing system that is based on who wants a license instead of just what they want to do with the music they're using."^{[66][67]} ASCAP also objected to the deal, filing a petition to deny with the FCC. The organization argued that the acquisition was not in the public interest because of Pandora's intent to use it as a "bargaining chip" for royalty payments. ASCAP also alleged that Pandora did not provide enough information about its ownership structure, failing to prove that less than 25% of the company was owned by foreign interests. On January 14, 2014, the FCC denied the acquisition until Pandora "demonstrate[s] adequate support for its foreign ownership compliance certification."^{[68][69]}

On September 1, 2013, Pandora removed the 40-hour-per-month limit on free mobile listening (originally announced on February 27, 2013). Pandora stated that it was able to make this change "thanks to the rapid progress of its mobile advertising."^[70]

In 2014, Pandora signed an agreement with some music copyright owners for lower royalties in exchange for more frequent streaming of songs. Though not illegal, this practice raised comparisons to payola, which is illegal payment for airplay on terrestrial radio.^[71]

On September 15, 2016, Pandora released "Pandora Plus", a new subscription service to compete with other streaming services; the price was set at \$4.99 and was available in later months.^[72]

6. Reception

In May 2010, Pandora was named in Lead411's 2010 Hottest *San Francisco* Companies list.^[73] In 2013, *Entertainment Weekly* compared a number of music services and granted Pandora a "B-", writing, "Free streaming radio, \$36 a year for ad-free. Launched in 2005, Pandora is available on just about every platform. There's no on-demand, though, and stations

tend to draw from a relatively small pool of albums."^[74] As of March 2014, the annual option was eliminated, and the \$3.99 monthly plan was the only way to get Pandora One. The price rose to \$4.99 a month in July 2014. The annual subscription was brought back and is now \$54.89 a year.

7. Advertising

Pandora initially offered a subscription-only service without commercials. However, the idea of paying did not sit well with most U.S. consumers and the company had to consider alternative business models to offer a free service. Then, in December 2005 Pandora sold its first advertisement.^[75]

In 2015, Pandora began playing more advertisements per hour in certain geographies and demographics. Pandora normally plays no more than 6 advertisements per hour for free users.^[76]

7.1. Revenue

Pandora became fairly popular within just two years. Starting from 2010 to 2012 Pandora's registered users had increased from 45 million to 125 million. The company's revenue increased from \$55 million to \$274 million, in which a majority of it from advertising. In order to appeal to a large audience of consumers, Pandora offers ad-free access for \$36 a year.^[77] During its 2011 fiscal year, Pandora reported \$138 million in revenue with a \$1.8 million net loss, excluding the cost of a special dividend associated with the IPO.^[78] Overall, Pandora has a 78 % of Internet radio, and it has a 9.3 % share of the U.S. public radio. Finally, in 2013 industry-wide total radio ad revenue increased to \$17.6 billion in the U.S.^[79]

7.2. Pitch to Advertisers

Pandora obtains its advertisers by explaining that the company reaches a narrower audience compared to terrestrial radio. "Pandora's pitch to advertisers is that its technology can cater to consumers with far greater precision than radio – it can pinpoint listeners by age and sex, ZIP code or even musical taste."^[77]

7.3. Methods of Advertising

There are a few different methods of advertising on Pandora. Audio advertising comes in spots of 15 to 30 seconds, and run once every 20 minutes. However, users only encounter ads if they are engaging with the site, like contributing a thumbs up or a thumbs down when changing a song or station.^[80]

Next, there are banner ads which are featured on the wallpaper of the site. As noted by *The New York Times*, banner ads are on Pandora in order "to promote engagement, audio segments can be accompanied by clickable display ads offering coupons or product information."^[80]

Advertising on Pandora works through a method of collecting data from the users online browsing activity. Once the data is collected, the company uses the data to show the user target ads. This process of advertising is also known as behavioral advertising. Pandora offers its users the option of submitting out of the targeted ads, by an opt-out configuration on its website. Opting-out will only prevent targeted ads, meaning users may continue to see generic (non-targeted ads) from these companies after they opt-out. Eventually, Pandora offers either targeted advertisements or generic advertisements for its non-subscribed users.^[81] However, Pandora's advertising does not offer local content such as the local news, weather, traffic, and talk.^[77]

7.4. Market Segments

Pandora has created two market segments, one for Spanish listeners, and another for English listeners. By creating multiple market segments, Pandora's advertising is customized to its users' needs. In order to create the first two market segments, the company cross-referenced its registered user data with U.S. census. Then, the cross reference allows the company to identify zip codes with high populations of Hispanic and Spanish-speaking people, and finally it ran tests overlaying the two data sets to infer which listeners fit into those buckets.^[82]

8. Internet Radio Competitors

Starting in the early 2010s, new entrants entered the personalized radio market, such as Grooveshark (launched 2007), iHeartRadio (launched 2008), Mog.com, TuneIn (founded 2002), AccuRadio, Rhapsody (launched 2001), and Europe's Spotify, all threatening to use the concept of "true" on-demand access to online music as a challenge to Pandora's personalized radio.

Europe's most popular online streaming music service, Spotify, launched in 2006 and arrived in the U.S. in mid-2011. As of 2016, Spotify has a catalogue of over 30 million songs compared to Pandora's library of around 1.5 – 2 million.^[83] As pointed out by editors Miranda Ferrara and Michele LaMeau, "Spotify allows users to upload their own songs to the online library. While Pandora allows listeners to connect to the social media site Facebook to see what their friends are listening to, Spotify users can quickly and easily share playlists with their friends through Facebook, Twitter, email, and SMS text messages".

The second competitor that is targeting Pandora's personalized radio appeal is iHeartRadio. Editors Miranda Ferrara and Michele LaMeau note "iHeartRadio is the largest radio operator in the United States with 237 million listeners and 800 stations in 150 markets, iHeartRadio, like Pandora, offers listeners the opportunity to like or dislike a song in order to receive recommendations on other tunes. It also offers custom tools that allow the listener to discover new artists or more songs based on existing choices".^[75]

Sirius XM has also become a competitor in recent years due to online-only accounts and being able to customize stations; their wide availability in both the new and used car market also gives it an advantage over Pandora. When acquiring XM Satellite Radio in 2007, Sirius actually accurately predicted that it would be competing against streaming services like Pandora in its argument with the Federal Communications Commission (FCC) over whether the merging of the only two satellite radio companies in North America would cause antitrust issues.^{[84][85]}

As recognized by the Ad Age staff, "Pandora has about 76 million monthly users, and about a 70% share of the internet radio market in the U.S."^[86] Ad Age predicted that competition would likely intensify due to Apple's acquisition of the Beats Music service, but Apple announced that it would be closing the service on November 30, 2015.^[87]

Yet even with all of its competition, Pandora's Promoted Stations rely on its core Music Genome Project. Overall, the Music Genome Project of more than 450 attributes assigned to each song with a human-curated database of recorded music gives a big edge over competitors like Spotify and Beats Music.^[88]

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