MUSIC CONSUMPTION CHOICES FOR AMERICAN TEENS

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So you like listening to music? To listen to pre-recorded music (as opposed to live music), you'll need to purchase some equipment. A few years ago, the choice would have been between a radio or a CD player. Today, there are lots more ways to get your music fix: Music videos on television, Internet streaming radio, MP3, DVD-Audio, digital cable radio, and satellite radio.

A bit of technology assessment is in order to help today's teen pick equipment that will meet their needs. This paper examines what the music needs of the average American teen are, and how various existing technologies/formats address those needs.

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The Teen Demographic

For the purposes of this paper, teens are defined as between the ages of 12 and 19. When cited sources use a different classification, the age range will be noted. This age range was chosen because it captures what Don Tapscott calls the "Net generation."[1] In 1981, the IBM PC was introduced. Born in or after 1982, these teens have never known a time without home computers.

According to the US Census Bureau, there are over 31 million teens today, comprising about 11 percent of the total US population. The rate at which the number of teens is growing is double that of the total population. The number of teens will reach a peak of 34 million in the year 2020.[2] In 1998, teens influenced about one-fifth of all household spending, approximately $278 billion.[3] As the teen demographic grows, so does its importance to marketers.

Teens and Technology

According to a 1997 survey done for the National Science Foundation, 99% of children in grades 7 thru 12 have used a computer at some point in their lives, and 80% use a computer on a weekly basis. They spend an average of 2 hours per week using computers, but 58% would like to spend more time using computers than they currently do. Sixty seven percent have a computer at home, but only 29% have Internet access at home. Only 55% of the teens have ever used the Internet.[4]

When teens listen to music, they are probably multitasking--listening to music while surfing the Internet, watching TV, or talking to a friend on the phone. Some try to do three at a
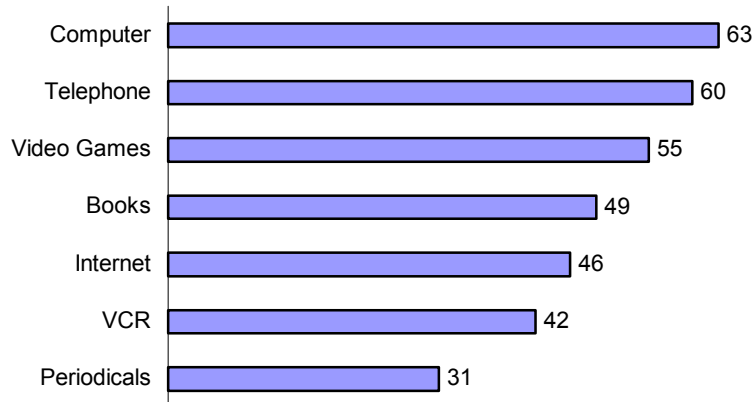
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[1] Quoted in Tapscott, Don, <u>Growing Up Digital: The Rise of the Net Generation</u>, McGraw-Hill, New York
[2] Marigny Research Group, Inc., "The Teens Market," Packaged Facts, [New York: April 2000], pp. 29-30
[3] Marigny Research Group, Inc., p. 9
[4] National Science Foundation, "U.S. Teens and Technology," CNN/USA Today/National Science Foundation/Gallup survey, 1997, available online: http://www.nsf.gov/od/lpa/nstw/teenov.htm

time.[5] This explains how children can spend an average of almost 4.5 hours in front of a screen of some sort (TV or computer) each day.[6] A 1997 survey found that 50% of teens reported their families kept the television on during dinner.[7] Figure 1 shows the time (in minutes) children between the ages of 12 and 17 spend with different media each day.

Media	Minutes
Computer	63
Telephone	60
Video Games	55
Books	49
Internet	46
VCR	42
Periodicals	31

Figure 1[8]

Figure 2 shows the distribution of various forms of media in the bedrooms of children between the ages of 8 and 16. Of the children with bedroom computers, 42% use them for doing homework, 41% use them to play games, and 14% use them to communicate (via email, chat rooms, and/or instant messaging).[9]
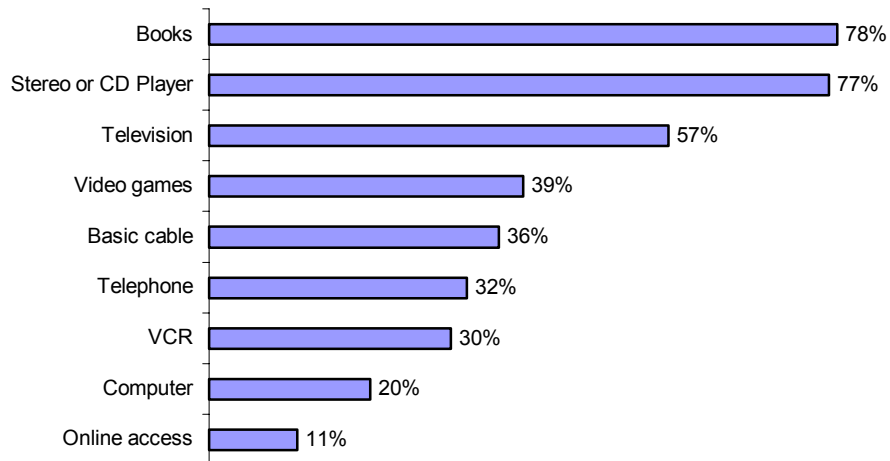
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[5] Brown, Erin, "The future of Net shopping? Your teens," <u>Fortune</u>, New York: April 12, 1999, p. 152, and Marigny Research Group, Inc., p. 18
[6] Woodward, Emory H., and Natalia Gridina, "Media in the Home 2000: The Fifth Annual Survey of Parents and Children," The Annenberg Public Policy Center Of The Univeristy Of Pennsylvania, 2000, p. 19, available online: http://www.appcpenn.org/mediainhome/survey/survey7.pdf
[7] Marigny Research Group, Inc., p. 151
[8] Woodward, p. 22
[9] Woodward, p. 17

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Books	78%
Stereo or CD Player	77%
Television	57%
Video games	39%
Basic cable	36%
Telephone	32%
VCR	30%
Computer	20%
Online access	11%

Figure 2[10]

A report issued in late 2001 by Jupiter Media Matrix found that one third of people downloading digital music from the Internet were under 18. [11] A prerequisite for downloading music is broadband Internet access. In August, the FCC announced that the number of high-speed Internet connections increased by 63% during the second half of 2000, reaching a total of 7.1 million.[12]

Teens and Music

Music serves three social functions: the management of self-identity, interpersonal relationships, and mood.[13] The portability of music made possible by technologies such as the transistor radio, Sony Walkman, and portable CD players has made music a "soundtrack to everyday life, and thus a central part of personal development and identity for many people."[14] Listening to music is the preferred activity during spare time, and teens specifically prefer

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[10] Woodward, p. 17
[11] "Teens dominate music downloads," Courier Mail, October 16, 2001, Section: News, p. 3
[12] Federal Communications Commission, "Federal Communications Commission Releases Data On High-Speed Services For Internet Access," August 9, 2001, available online:
http://ftp.fcc.gov/Bureaus/Common_Carrier/News_Releases/2001/nrcc0133.html
[13] Hargreaves, David & Adrian North, "The Functions of Music in Everyday Life: Redefining the Social in Music Psychology," Psychology of Music, 27:1 [1999], p. 72
[14] Hargreaves, "Everyday Life," p. 73

listening to entire albums.[15] A survey done in 2000 of 101 U.S. and U.K. schoolchildren with a mean age of 15.4 years found that 68 percent spend approximately the same amount of time listening to music with friends as they do alone.[16] Participants in the survey reported listening to music for a mean of 2.25 hours per day.[17]

An MTV commissioned survey of 300 "trendsetters" aged 14 to 30 found that "there is no one single sound, no single artist, and no single vision that seems to define either the future, or recent past, of music." These trendsetters prefer to discover new music through friends and nightclubs.[18] But most teens are not allowed to enter most nightclubs. An Australian study done in 1998 asked teens who or what influenced their tastes in music. Eighty five percent of those surveyed mentioned friends, 72% mentioned radio, and 51% mentioned television. Half of the respondents listen to music mainly on CDs, a third said radio, and only 4% used the Internet.[19] A study of American teens in general found that they look to local radio for exposure to new music. Teens often select one radio station to the exclusion of all others. They personally connect with the radio personalities and look to that station as a source for news about local events.[20]

Teens and Shopping

Teens are intelligent consumers. A 1999 survey that asked teens to rank what makes products cool found that 63% chose quality. Another survey found that 70% of teens said name

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[15] A 1998 Billboard survey found that 67% of US teens age 14-18 cited listening to music or videos as their preferred activity during their spare time; 80% of the respondents reported preferring entire albums to singles. Survey results reported in Marigny Research Group, Inc., p. 110

[16] Hargreaves, David, Adrian North, & Mark Tarrant, "English and American Adolescents' Reasons for Listening to Music," Psychology of Music, 28:2 [2000], p. 168

[17] Hargreaves, "Reasons"

[18] Morris, Chris, "MTV Reaches Out To Audience Via Research: Future Divined In New 'Trendsetters' Study'," Billboard, September 26, 1998.

[19] Ramsay, Gillian, "Youth, Music and the Media," Australian Broadcasting Authority, 1998 Communication Research Forum, p. 4, 6, available online: http://www.dcita.gov.au/crf/papers98/ramsay.doc

[20] Marigny Research Group, Inc., pp. 160-1

brands were important.[21] "Teens are much more likely to comparison shop than adults."[22] Teens, even more than adults, want and expect immediate gratification. But according to Forrester Research, only about 20% have credit cards.[23] A number of Web services provide online credit equivalents that can be used at designated online merchants.[24] Teens have an average weekly income of $80.[25]

A study conducted by the RIAA in November of 1997 divided music consumers into one of nine profiles. The largest category, called "Young Partiers," consisted of those under 25 who use music mainly as background or for setting a mood. "They represent 8% of the sample and 12% of music sales, buying on average 29 albums a year. Males outnumber females, 3-to-2. These consumers mostly like the hits and newer genres such as hip-hop, alternative, and dance, but they have low loyalty to bands and artists."[26]

When it comes to their music purchases, teens are very picky. A Canadian phone survey of 1,214 people conducted in 1998, consumers aged 15-19 said they needed to hear three songs from an album by a new artist before purchasing the album. By comparison, of all survey participants regardless of age, 40% said they only needed to listen to one or two songs before buying, 27% said three, and 23% said four or more.[27]

"Teens place high value on those new technological advances that allow them to express their individuality and independence, such as designing their own websites and burning their

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[21] Marigny Research Group, Inc., p. 12
[22] As quoted from Michael May of Jupiter Communications in Marigny Research Group, Inc., p. 88
[23] "Survey: The young: Youth, inc," The Economist, London, December 23, 2000, pp. s9-s10, available online: ABI/Inform Global
[24] Marigny Research Group, Inc., p. 249
[25] Marigny Research Group, Inc., p. 35
[26] Jeffrey, Don, "BUYCYCLES," Billboard, April 18, 1998
[27] Jeffrey, Don, "BUYING TREND$: Solutions Survey Reports Buyers' Attitudes in Canada," Billboard, August 22, 1998

own custom music CDs."[28] A survey quoted in the Packaged Facts report asked teens age 14-18 about their next planned purchase of musical equipment. Forty four percent said they intended to purchase recordable CDs, 28% a Sony MiniDisc, 10% computer equipment, and 9% either a DAT recorder or a mixing board.[29]

A Short History of Technological Innovations in The Recording Industry

It has been just over 100 years since Edison patented the phonograph. In that time, music has been published on wax cylinders, shellac records, vinyl records (of numerous diameters, playing speeds, and etching systems), 8-track cartridges, magnetic compact cassettes, Digital Audio Tapes, CDs, MiniDiscs, DVD, DVD-Audio, Super Audio Compact Disc, and downloadable computer files. At each transition, some companies reaped new profits and others went out of business. But many lessons have been learned--some repeatedly.

In 1948, Columbia released its new 33 1/3 rpm microgroove LP record format. Soon after, RCA released its competing 45rpm microgroove format. By 1950, there were four different speeds for phonograph players. They were backed by different manufacturers and had different pricing, audio quality, and playing time. These different formats were not all cross-compatible. Consumers delayed purchasing new microgroove players, and manufacturers were forced to release albums in multiple formats. This period was known as the "speed wars." As in all wars, there were no winners.[30]

Barely twenty years later, in 1971, Columbia released to the American market its new SQ system for quadraphonic--4 speaker--records. At the same time, JVC released a competing quad format, CD-4, in Japan. In 1971, RCA announced its support for the CD-4 format. Advertising for the two competing formats was bitterly antagonistic, with one side complaining that the other

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[28] Marigny Research Group, Inc., p. 46
[29] Marigny Research Group, Inc., p. 111
[30] Millard, Angre, <u>America on Record: A History of Recorded Sound</u>, Cambridge University Press, 1995, pp. 206-7

format was premature, and the response being that the others format was only a minimal improvement. The "quad war" was much like the "speed war"--customers were reluctant to purchase expensive new quad equipment because they were afraid to choose the wrong format.[31]

Before Philips introduced the compact cassette in 1963, it encouraged other companies to license the format but required them to use it without modifications. Philips worked with several Japanese equipment manufacturers so that when the format was released, players were available from a variety of manufacturers. It seemed the recording industry was learning. Although cassettes did not have as good frequency response as records, it was compact, durable, had a longer playing time, and the format allowed recording. Consumers quickly adopted the cassette format and began to use it in ways that the record companies didn't like--they began making unlicensed copies.[32]

In the late 1970s, there were a number of different formats for distributing music digitally, but manufacturers were hesitant to release them and have another standards war. So in 1977, they held a Digital Audio Disc Convention in Tokyo. Thirty five different manufacturers attended and began to define a common standard. The standard was finalized in 1980 and the first CD player was released in the United States in 1983. As with the compact cassette, consumers quickly adopted the CD.[33]

There must have been a changing of the guard after the CD entered the market, because the record industry has not seen fit to work together in quite the same way since. Between 1983, when the CD format was released to the US market, and 1991 when the first recordable CD-ROM drives were released, there were a variety of digital music recording technologies: Digital

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[31] Postrel, Steven, "Competing Networks and Proprietary Standards: The Case of Quadraphonic Sound," Journal of Industrial Economics, Volume 39, Issue 2 (December 1990), pp. 169-185
[32] Millard, pp. 316-7
[33] Institute of Electrical & Electronics Engineers, Inc., "DAR Timeline," available online: http://www.ieee.org/organizations/history_center/sloan/DAR/timeline.html

Audio Tape, Digital Compact Cassette, and MiniDisc.[34] None of these competing formats

achieved market dominance, and there is little if any pre-recorded content available for these

formats. New writeable CD drives, on the other hand, probably contributed to more sales of CD

players. A 1999 report states that there were 600 million CD players and 21.5 million CD-R

(burner) drives in the market that year. While the estimate of CD players for 2001 was only 720

million, the estimate of CD-R drives for 2000 was 46.2 million, then reaching 90.4 million in

2001.[35] This growth is proof of the popularity of CDs and CD burners, but the recording industry

is not all about technology:

> If there is one lesson a businessperson might learn from this
> history, it is that technology does not count for everything in this high-tech
> industry. Emphasizing the machine and putting technical considerations
> above artistic ones was the mistake made by Thomas Edison, and it
> proved fatal for his phonograph. Time and time again it was the mass
> appeal of the music recorded and not performance of the record or player
> that was critical in achieving commercial success.[36]

Current Music Delivery Formats

For the purposes of this paper, the following current music delivery formats and

technologies will be considered: FM radio, CD, MP3, secure files, digital cable radio, satellite

radio, Internet radio, and DVD-Audio. Although DAT and MiniDisc hardware is still sold, they

were excluded from this analysis because pre-recorded content is not available in these formats.

The Super-Audio CD format created by Sony and Philips is very similar to the DVD-Audio

format. For this reason, the SACD standard is not included as a separate format in this

evaluation. The cassette tape format is not included for similar reasons.

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[34] Despain, Jeremy, "History of CD Technology," OneOff Media, Inc., available online:
http://www.oneoffcd.com/info/historycd.cfm
[35] Dörper, Ralf, John Nuttall, Harry Philips, and Karsten Oblinger, "High tech engineering: Optical storage equipment," WestLB Panmure, November 7, 2000, available online,
http://www.westlbpanmure.com/documents/high_tech_engineering/High_tech_engineering.pdf. Unfortunately, more recent figures could not be found.
[36] Millard, p. 8

The following list gives a brief introduction to each format.

- FM Radio - The most common technology for the consumption of music.

- CD - The leading format for the sale of pre-recorded music, and the second most common technology behind radio.

- MP3 - Short for MPEG Layer 3, this is the most common format for online distribution of music. MP3 files can be downloaded to a user's computer and played when off-line and can also be transferred to portable music devices such the SonicBlue Rio and Creative Labs Nomad. Most record labels are hesitant to support the format because it does not incorporate any protections against unlimited copying. On average, MP3 files use 1Mb of space for each minute of audio. Downloading a 3 minute song on a 56k modem would take about 7 minutes. A broadband connection is not required to download MP3 files, but downloading a large number of songs would be quite tedious.

- Secure files - This is a blanket term to cover a small variety of digital music file formats that incorporate some sort of rights management (DRM) system. In other respects, secure files are similar to MP3 files. The emphasis is not on the file format but on the fact that it is endorsed by record labels. Examples of secure digital formats are Microsoft Windows Media Audio (WMA), Advanced Audio Codec (AAC), and LiquidAudio. This term can be applied to purchases of single files or subscription services that allow users to download an unlimited amount of songs that will become unusable if the subscription is cancelled. This does not include streaming services (whether free or subscription).

- Digital cable radio - There are a few companies that provide a selection of

  commercial-free CD-quality music stations thru existing cable television and satellite

  television systems. This service is only available to consumers who already have

  cable or satellite television thru a provider that also has a digital cable radio service.

  Different providers have different price structures. The largest is Music Choice,

  which has 50 stations and has implemented a number of interesting features in the

  past few months: the ability to purchase the album for the song currently playing via

  the Music Choice remote control, display of song information on the TV screen,

  optional display of additional information such as artist facts, album cover art, music

  news, new releases, etc.[37] For the purposes of this paper, Music Choice will be taken

  as representative for all such services.

- Satellite radio - At the moment, there is only one satellite radio service--XM Radio.

  There is another service that will launch in February 2002.[38] These services are

  similar to the concept of digital cable radio, but are designed to be used primarily in

  the car. The don't require a television and are not packaged as part of a television

  subscription service. XM Radio provides 100 channels, 71 of which are music, and 29

  of which are news and talk shows.[39] As this service is primarily for cars and has high

  equipment costs, it is likely not suited for teens.

- Internet radio - Internet radio can be as simple as a real-world FM radio station

  "simulcasting" its programming by streaming it from the station Web site to listeners

  that are out of range of the station's antenna. Because Internet radio doesn't suffer the

  frequency scarcity of FM and can support FM stations from multiple markets, the

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[37] Music Choice, available online: http://www.musicchoice.com/
[38] Sirius Satellite Radio, available online: http://www.siriusradio.com
[39] XM Satellite Radio, available online: http://www.xmradio.com

variety of programming is much greater than FM radio. Internet radio requires a

broadband Internet connection for acceptable playback quality while still allowing

users to do other tasks on the Internet. At present, Internet radio broadcasts are played

almost exclusively from computers. There have been some "Digital Audio Player"

products, but they have been mostly ignored by the market. For the purposes of this

paper, it will be assumed that Internet radio is a variety of free broadcasts that are

accessed only from personal computers.

- DVD-Audio - The DVD-Video format was the first mass-marketed format capable of

    multi-channel audio. The follow-up DVD-Audio standard improves the audio quality

    even more. The DVD-Audio standard is now incorporated in most new DVD-Video

    players, which also play CDs. There are no DVD-Audio-only players. The music

    industry is split as to whether the DVD-Audio format should be the replacement for

    the CD audio standard.

Analysis

For the purposes of this paper, the following categories for evaluating current music

delivery technologies will be used: variety of content, maximum capacity/playback time, audio

quality/fidelity, portability, cost, compatibility. The following sections give a brief introduction

to each category and explain the relative merits of the different formats selected for this study.

As a quantifiable measure is not possible for most, a subjective ranking is given instead.

Although actual products and services may differ, this paper is more interested in the

technological formats. The rankings for individual formats are based on the best real-world

products, and duplicate rankings are used for formats that are similar in features.

Variety of Content

The Big Five record labels (BMG Entertainment, EMI Recorded Music, Sony Music Entertainment, Universal Music Group, and Warner Music Group) may control 85% of U.S. music sales[40], but most trendsetters believe the best new music comes from elsewhere.[41] One of the biggest draws of the MP3 format is that it allows unsigned artists to distribute their music. On the other hand, because it is unprotected the Big Five labels do not provide their content in MP3 format. Services of questionable legality such as Napster (created by a teenager, 19-year old Shawn Fanning) were created to fill this gap. [42] Including the unlicensed content available thru peer-to-peer services, the MP3 and formats receives a high ranking in this category. When the Big Five record labels begin their secure file services in the coming months, the situation will change drastically. There are only about 200 releases in the DVD-Audio format, but both the DVD-Video and DVD-Audio formats are capable of including additional non-music content such as video clips, photos, and text.[43]

This category is specifically concerned with the variety of content available in each format. The fact that players for some formats support content in other formats is incorporated into the compatibility category. Variety of content incorporates not just the variety of music available in each format, but whether that format includes additional content such as local news, artist info, concert news, and purchase options. FM stations provide local news and may play

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[40] Michael Learmonth, "Big record houses go digital this summer," The Industry Standard, March 9, 2000, available online: http://www.cnn.com/2000/TECH/computing/03/09/records.go.digital.idg/

[41] As reported in Billboard's article about the 1999 MTV Trendsetters survey, "73% of the survey respondents say that the best new music comes from clubs and local venues instead of major labels." Hay, Carla, "Music Video: Trying to Envision the Future - MTV Study Tracks 'Trendsetter' Tastes," Billboard, November 13, 1999

[42] Levy, Steven, Brad Stone, N'Gai Croal, Jennifer Tanaka, and Adrian Campo-Flores, "The Noisy War Over Napster," Newsweek, June 5, 2000

[43] DigitalAudioGuide.com, "What is DVD-Audio?", DVD-Audio FAQ Version 2.2, March 19, 2001, available online: http://www.digitalaudioguide.com/faq/dvd-audio/faq_1.htm

songs from local unsigned bands not available anywhere else, but they also have advertising. This puts FM radio at the bottom of the ranking.

Rank	Format
1	CD
2	MP3
3	Internet radio
4	Satellite radio, Digital cable radio
5	FM radio
6	DVD-Audio
7	Secure files

Maximum capacity/playback time

As the history of the LP record shows, the length of playback time is an important factor for music consumers.[44] As teens spend an especially large amount of time listening to music, this should be an important factor for them too. Early MP3 players that only had 32MB of memory-- allowing less than an hour of playback time--were considered too limited by most people. The XM satellite radio system , on the other hand, is promoting the fact that users can listen to the same niche music station while driving across the country. Today, hard-drive and CR-ROM based portable digital music players can store tens of hours of music. DVD-Audio discs can hold over two hours of multichannel music and much more stereo quality much.[45]

Rank	Format
1	Satellite radio, Digital cable radio, Internet radio , FM radio
2	DVD-Audio
3	MP3, Secure files
4	CD

Audio quality/fidelity

The CD format is the current reference for audio quality tests. A double-blind test of MP3 and a variety of secure file formats found that they don't quite measure up to CDs for quality, but

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[44] Millard, p. 208

[45] DigitalAudioGuide.com, "What is the DVD-Audio Specification?", available online: http://www.digitalaudioguide.com/faq/dvd-audio/faq_2a.htm

that the difference is hard for the average listener to notice.[46] Digital radio systems match the CD

format for quality, and the new DVD-Audio format greatly increases fidelity and adds

multichannel "surround sound" ability.

Rank	Format
1	DVD-Audio
2	CD, Satellite radio, Digital cable radio
3	Secure files
4	FM radio
5	MP3
6	Internet radio

Portability

This category examines the portability aspects of the hardware and content: how small

are players, does playback skip if the unit is jostled, does the distribution format allow the

content be transferred to other formats (for example, CDs can be copied to cassette tapes, but

secure files usually prevent transferring content to audio CDs). Although not as easily

transferable to digital formats as CD and MP3 format, the shock resistance, small size, and

ubiquity of FM radios gets the tried-and-true format top ranks. FM is portable for another reason-

-because almost every vehicle and home has one, there's no need to carry a radio with you.

Although portable MP3 players are smaller and more shock resistant than CD players and MP3s

can be easily burned to CD, this requires a CD burner, some expertise, and time. At least one

brand of satellite radio receiver is designed to be easily moved between car and home, something

that isn't possible for Internet and digital cable radio formats. There are a few handheld DVD-

Video players, but there is presently only one portable DVD-Audio player, designed for the

car.[47] DVD-Audio employs a and Secure files receive the lowest marks because they use copy

protection systems that prevent transferring content to other formats. Although secure file

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[46] Ranada, David, "Download Showdown II," Sound & Vision, 65:7 [September 2000] pp. 113-114, 117-118, available online: IIMP number 00171120

[47] Walsh, Christopher, "Surround 2001: An Expanded Pro Audio Selection - From Your Couch To Your Car," Billboard, December 15, 2001, available online: Lexis-Nexis

formats allow transferring to portable digital music players, most DRM systems restrict the

number of transfers allowed.

Rank	Format
1	FM radio
2	CD
3	MP3
4	Satellite radio
5	Secure files
6	DVD-Audio
7	Internet radio, Digital cable radio

Cost

Different formats have different pricing structures: per song, per album, and per month.

Some formats require a significant investment in hardware, other formats include the hardware

as part of the subscription fee.

Rank	Format	Hardware	Media
1	FM radio	$10 and up	Free
2	Internet radio, MP3	$80 and up *	Free
3	Digital cable radio	(included in subscription)	$10/month
4	CD	$30 and up	$15/album
5	Secure files	$80 and up *	$0.99-$2.99/song
6	Satellite radio[48]	$300-600	$10/month
7	DVD-Audio	$300 and up for DVD-Audio players	$20-25/album

* The hardware costs for MP3 and secure files are for portable digital music players. The
cost of the computer required to obtain MP3s, secure files, and Internet radio is not factored
into these costs as teens are not likely to purchase their own computers.

Compatibility

This category is concerned with ensuring that customers hardware investments won't be

made obsolete in the future. Issues of obsolescence of content are considered in the portability

category. According to the RIAA, manufacturers shipped 942.5 million album-length CDs in

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[48] Fyffe, Steven, "Lost in space?; Satellite radio signals have started pouring down. But given the economy, will these new services fly?", CommVerge, December 1, 2001, Sec: Features, p. 34, available online: Lexis-Nexis Academic

2000, more than ten times the number of cassettes or records shipped.[49] Music industry expert opinions on when new formats like DVD-Audio will overtake the CD format are from 5 to 20 years.[50] To eliminate fears of the DVD-Audio format becoming obsolete, the standard allows discs to contain both DVD-Audio and DVD-Video formats, so the discs are usable in DVD-Video players that do not include DVD-Audio support.

On the opposite end of the spectrum (figuratively and literally), there are only two satellite radio companies: XM Radio and Sirius. Sirius has postponed its launch date and the CEO recently resigned. XM Radio is struggling to sign up 400,000 customers by the end of the year, and has admitted it won't break a profit until 2004.[51] There is tremendous risk for these two companies and the consumers who purchase satellite radio hardware. As these services use proprietary standards, if they stop broadcasting, customers won't be able to use their receiver with another satellite radio company. The portable music player market is in a much better situation. Most players that support some sort of secure file format also support the open MP3 standard. Although SDMI attempted to define an open format for secure files, the initiative has stalled.[52] But the current secure file and MP3 formats do not have the audio quality of CDs and may be soon replaced by an incompatible format. Because there are no equipment purchases associated with Internet radio (in addition to the personal computer itself) and digital cable radio, they are not included in the rankings.

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[49] "2000 Yearend Statistics," Recording Industry Association of America, available online: http://www.riaa.org/pdf/year_end_2000.pdf

[50] Christman, Ed, "Strong Staying Power Seen For CDs Despite New Music Formats," Billboard, October 20, 2001, available online; Lexis-Nexis

[51] Fyffe

[52] Borland, John, and Gwendolyn Mariano, "Anti-piracy feud bodes ill for Web music," CNET News.com, November 26, 2001, 4:00 a.m. PT, available online: http://news.cnet.com/news/0-1005-200-7943556.html

Rank	Format
1	FM radio
2	DVD-Audio
3	CD
4	Secure files
5	MP3
6	Satellite radio

Conclusion

For many reasons, the CD is still the best format for teens. Listening to music is often a social activity and teens are very concerned with fitting in. The CD's popularity and wide variety of content means that it won't seem out of place. Teens' broad and quickly changing tastes may not be fully met by the limited content available in other formats. The wide availability of CD burners allow teens to make their own compilation CDs to share with friends, or even create CDs of their own digitally recorded performances. The combined chart below does not give a complete picture. Almost every format received top ranking in at least one category. But by ignoring one or more categories, we can find out what formats best fit in different situations-- now and in the near future.

Format	Content	Capacity	Quality	Portability	Cost	Compatibility
FM radio	5	1	4	1	1	1
CD	1	4	2	2	4	3
MP3	2	3	5	3	2	5
Secure files	7	3	3	5	5	4
DVD-Audio	6	2	1	6	7	2
Digital cable radio	4	1	2	7	3	N/A
Satellite radio	4	1	2	4	6	6
Internet radio	3	1	6	7	2	N/A

Because teens like immediacy and many have Internet access, secure files seem like a good choice once the major labels make content available in the coming months. Ignoring cost (considering teens influence household purchase decisions, this isn't unreasonable), the DVD-Audio format seems to provide something that the other formats can't: more information, in the form of lyrics, short videos, photos, and text. Respondents to MTV's 1999 Trendsetters survey

said they "desire to touch, feel, explore, and examine music that they're passionate about."[53] Newer versions of the Music Choice digital cable radio system can also accompany music with some text and video.

The evolution of music delivery technologies has not stopped. The next year may see the introduction of digital terrestrial radio, online music subscription services, third generation (3G) high-bandwidth wireless digital networks that can be used to download music to smart phones, and home digital audio players that provide the functions of an Internet radio player in a component that integrates into a home stereo system. As these new media formats and technologies are introduced, this study will loose some relevance. But the basic insights into teen habits and the ranking system used may still be helpful.

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[53] As quoted from MTV General Manager Van Toffler in Hay

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