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**THE ROBOT’S RECORD:
PROTECTING THE VALUE OF INTELLECTUAL
PROPERTY IN MUSIC WHEN AUTOMATION
DRIVES THE MARGINAL COST OF MUSIC
PRODUCTION TO ZERO**

*William P. Jacobson**

Technologies such as the Internet and MP3 file format have taken their toll on the traditional business models used by entities like record labels and music retailers. Now, technological innovations such as open-sourcing, crowdsourcing, and compusourcing are resulting in a democratization of music production that threatens to end the monopoly skilled musicians enjoy in the music-creation marketplace. These innovations are also driving the generation of an increasing supply of music with few or no reserved copyrights and a potential decline in the average value of intellectual property in music. This Comment explores the threat computer-generated music poses to the music industry. It further proposes that a “Natural Talent” certification mark may provide a way for musicians to certify their works as “authentic” and differentiate their music from that produced by computers.

I. INTRODUCTION

Information technologies and the Internet are game-changing forces within the music industry.¹ Virtually any conversation on this topic

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1. See generally Eamonn Forde, *The Digital Decade*, MUSIC WEEK, Dec. 12, 2009, at 18; PATRICK WIKSTROM, *THE MUSIC INDUSTRY: MUSIC IN THE CLOUD* (Polity Press 2009); Mark Bender, *The Impact of Digital Piracy on Music Sales: A Cross-Country Analysis*, 84 INT’L SOC. SCI. REV. 157 (2009).

includes words and phrases such as “Napster,” “iTunes,” “going viral,” “digital rights management,” “streaming,” “peer-to-peer downloads,” and “piracy.”² Discussions primarily pertain to the consumer end of the music supply chain, the segment that includes the activities of marketing, distribution, and retailing—the stages just prior to the moment of consumption.³ This segment witnessed fundamental changes in the mid- to late-nineties, such as the standardization of the MP3 file format in 1993⁴ and the release of the Napster peer-to-peer file downloading system in 1999.⁵ These developments transformed the relationship between music fans and record labels and resulted in huge financial losses for businesses in the recording industry due to piracy.⁶ The public’s adoption of new ways of finding, sharing, purchasing, and listening to music caused a major shift in bargaining power among players in the music industry.⁷

However, the forces of digitization also loom large at the opposite end of the supply chain—where music is created—and continue the assault on traditional business models.⁸ This second front has received far less attention from experts, despite its potential to be the origin of some of the most transformational changes the music industry has thus far endured: the end of the monopoly that skilled musicians currently enjoy over the creation and the release of massive quantities of music with few or no reserved copyrights.⁹ This Comment explores the threat computer-generated music

2. *Id.* Anecdotally, a LexisNexis search of magazine and newspaper stories written in the past decade revealed that 565 of the 1871 articles that contained the term “music industry” in the same segment as “information technology” also contained at least one of the example words or phrases listed.

3. See *Supply Chain Definition*, DICTIONARY.COM, <http://dictionary.reference.com/browse/supply+chain?s=t> (last visited Mar. 15, 2012).

4. *About mp3*, MP3LICENSING.COM, <http://mp3licensing.com/mp3/> (last visited Mar. 12, 2012).

5. Spencer E. Ante, *Inside Napster: How the Music-Sharing Phenom Began, Where It Went Wrong, and What Happens Next*, BUS. WEEK, Aug. 14, 2000, at 113.

6. See Stephen E. Siwek, *The True Cost of Sound Recording Piracy to the U.S. Economy*, INST. FOR POL’Y INNOVATION, Pol’y Rep. 188, 5 tbl.1 (Aug. 2007), [http://www.ipi.org/IPI%5CIPublications.nsf/PublicationLookupFullTextPDF/51CC65A1D4779E408625733E00529174/\\$File/SoundRecordingPiracy.pdf?OpenElement](http://www.ipi.org/IPI%5CIPublications.nsf/PublicationLookupFullTextPDF/51CC65A1D4779E408625733E00529174/$File/SoundRecordingPiracy.pdf?OpenElement) (quantifying losses to the music industry as a result of piracy, both physical and downloaded).

7. See Jennifer Beauprez, *Defiance Propels Music Trading: Web Means ‘Free’ to File Sharers*, DENVER POST, Sept. 1, 2003, at C1 (discussing the pressure music labels face to lower prices and conciliate consumers as a result of consumers’ capacity and willingness to download music for free).

8. See *infra* Part II.

9. See David Sarno, *Need A Drummer? No Problem: Collaborative Music Sites Make Finding Bandmates Easier Than Ever*, L.A. TIMES, Aug. 19, 2007, at E14 (“Music recording, once the province of professionals and hard-core amateurs, has now become so easy that anyone with a computer can do it.”); see *infra* Part II.

poses to the music industry. It further proposes the introduction of a “Natural Talent” certification mark to mitigate the erosion of the value of intellectual property in music by appealing to consumers’ preference for the authenticity inherent to music created through genuine human talent.

II. OPEN-SOURCING, CROWDSOURCING, AND COMPUSOURCING, OH MY!

Just as technology makes it easier for consumers to obtain music, technology also makes it easier for musicians to create music.¹⁰ Musicians can set up professional-quality recording studios in their homes, while commercial studios are closing and sound engineers are hard-pressed to find employment.¹¹ Sophisticated music and audio production software that was once prohibitively expensive and complicated for most musicians,¹² like industry-standard Avid’s Pro Tools, can now be purchased for as little as \$699 and run on a standard personal computer.¹³ Digital sound libraries and component plug-ins that are several gigabytes in size can now fit easily on inexpensive hard drives,¹⁴ replacing thousands of dollars worth of hardware synthesizers, samplers, sequencers, mixers, and physical instruments.¹⁵ Even the human voice can be filtered and sanitized of imperfections by software like Antares’ Auto-Tune, a tool that was cutting-edge when Cher used it in her 1998 song “Believe” but is now used routinely by both amateur and Grammy Award-winning singers alike.¹⁶ This expanding

10. Sarno, *supra* note 9 (“Music recording, once the province of professionals and hard-core amateurs, has now become so easy that anyone with a computer can do it.”).

11. Nathan Olivarez-Giles, *Studios Left Out of the Mix: Inexpensive Software Shifts Music-Recording to the Home*, L.A. TIMES, Oct. 13, 2009, at B1.

12. See Dawn M. Norfleet & Monique R. Brown, *A Sound Investment*, BLACK ENTERPRISE, Dec. 1, 1999, <http://www.blackenterprise.com/1999/12/01/a-sound-investment/> (noting that in around 1999, “[a]t \$20,000 for just the software and some basic accessories, ProTools is currently the most expensive recording program on the market”).

13. *Pro Tools 10*, AVID, <http://www.avid.com/US/products/pro-tools-software/?intcmp=AV-MM-S1> (last visited Mar. 15, 2012).

14. See, e.g., *Reason Pianos ReFill*, PROPELLERHEAD, https://www.propellerheads.se/shop/index.cfm?fuseaction=product_detail&ID=10182&Cat=4000 (last visited Mar. 15, 2012) (advertising that the Propellerhead Reason Pianos Refill provides three “hypersampled” acoustic pianos as a downloadable file for \$129 that is 631 MB or 1.45 GB, depending on sample frequency).

15. *Reason 6*, PROPELLERHEAD, https://www.propellerheads.se/shop/index.cfm?fuseaction=product_detail&ID=10726&Cat=1000 (last visited Mar. 15, 2012) (advertising that the \$449 Reason 6 software is equipped with “all the instruments, sounds and effects you could ever dream of for writing, recording, remixing and producing great-sounding tracks”).

16. Sasha Frere-Jones, *The Gerbil’s Revenge: Auto-Tune Corrects a Singer’s Pitch*, NEW YORKER (Jun. 9, 2008),

computer music software market grew from nearly \$150 million in 1999 to approximately \$425 million in 2008.¹⁷ Empowered by new tools that boost their productivity, more musicians (and non-musicians) are creating music than ever before.¹⁸

A. Open-Sourcing

In 1998, several prominent leaders in the software industry met in Silicon Valley, California and coined the term “open-source” to refer to a philosophy of transparency, collaboration, innovation, and “free software” among computer programmers.¹⁹ Musicians participate in open-sourcing by offering lyrics, music tracks, sound samples, and entire songs under an artistic license such as Creative Commons (“CC”), which allows musicians to explicitly and automatically give certain rights to licensees (likely, anyone who accesses their work), while reserving certain other rights to themselves.²⁰ The Federal Circuit Court has upheld these licenses, stating that copyright holders who engage in open-source licensing are entitled to injunctive relief under copyright law, beyond the monetary damages authorized if open-source licenses were recognized as mere contracts.²¹ Musicians post their creations on websites like Opsound.org, which encourages visitors to the site to “download, share, remix, and reimagine.”²² Respected artists such as Rivers Cuomo of Weezer, The Roots, John Legend, Yo Yo Ma, and Nine Inch Nails have each uploaded stems (vocal, drum, and guitar tracks) under CC licenses from which others can create new music.²³

http://www.newyorker.com/arts/critics/musical/2008/06/09/080609crmu_music_frerejones?currentPage=all.

17. NAT’L ASSOC. MUSIC MERCHANTS, NAMM GLOBAL REPORT 28 (Ken Wilson ed., 2009), available at <http://www.nxtbook.com/nxtbooks/namm/2009musicusa/#/0>.

18. See Neil McCormick, *Is There Too Much Music?*, DAILY TELEGRAPH, Apr. 9, 2009, at 33 (arguing that the sheer volume of music being released on Internet sites like YouTube, MySpace, iTunes, and Spotify by amateurs and professionals alike is overwhelming consumers).

19. *History of the OSI*, OPEN SOURCE INITIATIVE, <http://opensource.org/history> (last visited Mar. 15, 2012).

20. *About the Licenses*, CREATIVE COMMONS, <http://creativecommons.org/about/licenses/> (last visited Mar. 15, 2012) (describing the four types of CC licenses: Attribution, ShareAlike, NonCommercial, and NoDerivatives).

21. See *Jacobsen v. Katzer*, 535 F.3d 1373, 1381–82 (Fed. Cir. 2008).

22. OPSOUND: FREE LOVE, FREE MUSIC, <http://opsound.org/index.php> (last visited Mar. 15, 2012); see also *What Is Jamendo?*, JAMENDO, <http://www.jamendo.com/en/about> (last visited Mar. 15, 2012) (exemplifying a second popular website for open-source music released under a CC license).

23. Jason Feehan & Randy Chertkow, *Q&A: Eric Steuer*, ELECTRONIC MUSICIAN, Nov. 1, 2009, at 40, 42 (interviewing Eric Steuer, the creative director at Creative Commons about opportunities for music under a CC license); Jon Pareles, *Music Ripe To Remix*, N.Y. TIMES, Mar. 10,

Perhaps more significant than the free sharing of simple audio files (such as MP3s), is the sharing of the underlying session files generated by different production software. Session files expose the individual notes of melodies and chords, parameters defining instrument properties and special effects, tempo settings, and the sequence of tracks.²⁴ With these files and the software that supports them, a user can replace a Steinway D grand piano with a Yamaha C7 in a score with a few simple clicks of a mouse.²⁵ Some of the best software available for this type of music development work is itself open-source, and available free of charge.²⁶

Creative Commons estimates that there were approximately 350 million CC-licensed works in 2009, an increase from 4.7 million licensed in 2004.²⁷ This number will likely continue to increase as more individuals with varying degrees of musical ability embrace the open-source philosophy by sampling, remixing, and modifying countless nth generation derivative works and uploading them to the Internet where they will, no doubt, be fruitful and multiply.²⁸

B. Crowdsourcing

Crowdsourcing is the strategy of utilizing the relatively inexpensive labor of a large group of people to accomplish tasks traditionally completed by a much smaller group of more specialized individuals, such as employees.²⁹ In recent years, the Internet has dramatically increased the

2008, at E1 (stating that Trent Renzor of Nine Inch Nails has “encouraged listeners to remix, ‘mutilate or destroy’ the Nine Inch Nails catalog, even providing some separate instrumental parts. Now, with [the band’s new album] ‘Ghosts,’ he’s virtually inviting other people’s voices.”).

24. ANDREA PEJROLO, CREATIVE SEQUENCING TECHNIQUES FOR MUSIC PRODUCTION: A PRACTICAL GUIDE TO LOGIC, DIGITAL PERFORMER, CUBASE AND PRO TOOLS 69 (2005).

25. See, e.g., *Reason Pianos: What Is It?*, PROPELLERHEAD, http://www.propellerheads.se/products/refills/rpi/index.cfm?fuseaction=get_article&article=what_is_it (last visited Mar. 15, 2012).

26. See Peter Kirn, *Making Music with Free and Open Source Software: Top Picks from Red Hat, Dave Phillips* (April 20, 2011), CREATEDIGITALMUSIC.COM, <http://createdigitalmusic.com/2011/04/making-music-with-free-and-open-source-software-top-picks-from-red-hat-dave-phillips/>.

27. *History*, CREATIVE COMMONS, <http://creativecommons.org/about/history/> (last visited Mar. 15, 2012).

28. See *nth Definition*, DICTIONARY.COM, <http://dictionary.reference.com/browse/nth> (last visited Mar. 15, 2012) (“[B]eing the latest, or most recent: This is the nth time I’ve told you to eat slowly.”).

29. See Jon Swartz, *Online Talent Scouts Pay Off: Companies Use “Crowdsourcing” to Find Cheap Help, Expertise*, USA TODAY, Apr. 1, 2010, at 6A.

ability of people to collaborate and communicate.³⁰ Such decentralized communication has resulted in a slew of crowdsourcing projects, many of which have been promoted as contests.³¹ Even the United States government took notice of the potential for crowdsourcing when Congress passed the America COMPETES Reauthorization Act of 2010, which empowers Federal Agencies to “carry out a program to award prizes competitively to stimulate innovation.”³²

Music production is well suited for a crowdsourcing model.³³ First, music has very broad appeal, and thus there are vast numbers of individuals interested in its creation.³⁴ Second, because an individual song can be as short as a couple of minutes, even those with limited musical experience consider themselves up to the challenge.³⁵ Third, as discussed previously, the open-source movement has made music building blocks and construction tools both inexpensive and accessible.³⁶ Finally, music is easily stored in digital form, allowing for its dissemination across the Internet.

Many organizations have emerged to foster crowdsourced music, and perhaps the most popular is Indaba Music.³⁷ Indaba Music, found at IndabaMusic.com, is an organization that facilitates over 600,000 music collaboration projects among its 525,000 members across more than 100 coun-

30. See Brian Morrissey, *Brands' Mass Appeal*, ADWEEK (May 31, 2010), http://www.adweek.com/aw/content_display/news/digital/e3if3584cb6d538b8e11437b1dcf8866519.

31. *Id.* (describing crowdsourcing projects such as Netflix's \$1 million prize for improving movie recommendations and Pillsbury's \$10,000 prize for developing the best ad for its crescent rolls).

32. See AMERICA COMPETES REAUTHORIZATION ACT OF 2010, H.R. DOC. NO. 111-4785116 (2010) (allowing agencies to target entities other than corporations and professionals to submit solutions to a problem for a chance to win a prize, rather than employing a traditional request-for-proposal-and-bid model).

33. See Eliot Van Buskirk, *Finally, the On-Demand, Online Garage Band Gets Real*, WIRED (Apr. 30, 2007), http://www.wired.com/entertainment/music/commentary/listeningpost/2007/04/listeningpost_0430 (stating that the combination of “social networking apps and web-based audio tools . . . will do for music creation what technology has already done for music consumption: remove barriers of time, space and scarcity.”).

34. See, e.g., Janelle Gelfand, *Almost Famous, As Musicians*, CIN. ENQUIRER (OHIO), Jan. 14, 2007, at 1J (“[M]ore schools of higher learning than ever are turning out increasing numbers of accomplished musicians.”). See generally *Company of the Year: M-Audio: Proven Ability to Anticipate the Needs of “Computer-Centric” Musicians Commands a \$174 Million Purchase Price*, MUSIC TRADES, Apr. 1, 2005, at 124(2).

35. See *id.*

36. *Supra* Part II.A.

37. Eric Steuer, *Group Effort*, WIRED, Jul. 2009, at 60 (describing the top ten sites for participating in “virtual jam sessions” including Indaba Music, SoundCloud, JamGlue, and WeMix).

tries.³⁸ Another example is Aviary's Music Creator, an online application offering thousands of songs licensed under CC for both commercial and non-commercial use.³⁹ Aviary allows users to choose instruments and compose melodies,⁴⁰ and the application automatically tracks which works are derivatives of others.⁴¹

Crowdsourcing allows the power of social networking to be applied to creating music.⁴² The television program *American Idol* utilizes the wisdom of the crowd to create music celebrities by having viewers call in to vote for their favorite performers.⁴³ Another paradigm shift will occur when enough people discover that the crowd can simply create its own music too.

C. Compusourcing

Perhaps the most extreme and far-reaching development facing the music industry is computer-generated music. As computing capability increases, few endeavors have remained immune from the steady replacement of brain power with processing power, and music development is no exception. Accordingly, it seems likely that soon, no human intervention, even with regard to creative decision-making, will be required in order for computers to compose a piece of music.

A substantial portion of the required technology to produce computer-generated music already exists and it is rapidly improving. For example, Zenph Sound Innovations is a company using the "power of computer

38. See *The Colbert Report: Dan Zaccagnino* (Comedy Central television broadcast Feb. 2, 2009), available at <http://www.colbertnation.com/the-colbert-report-videos/217342/february-02-2009/dan-zaccagnino> (interviewing Dan Zaccagnino, co-CEO and founder of Indaba Music); see also Max Willens, *With Relaunch, Indaba Goes Major*, WE ALL MAKE MUSIC (Aug. 30, 2010), <http://weallmakemusic.com/with-relaunch-indaba-goes-major/>; Van Buskirk, *supra* note 33 (providing examples of five crowdsourced songs from a recent competition facilitated by Indaba Music).

39. See *Music Creator*, AVIARY.COM, <http://www.aviary.com/tools/music-creator> (last visited Mar. 15, 2012); *Aviary Launches Music Creator!*, AVIARY.COM (June 10, 2010, 12:50 PM), <http://blog.aviary.com/aviary-launches-music-creator>.

40. *Aviary Launches Music Creator!*, *supra* note 39.

41. *Frequently Asked Questions*, AVIARY.COM, <http://support.aviary.com/entries/188913-frequently-asked-questions> (last visited Mar. 15, 2012).

42. See Bernardo A. Huberman, Daniel M. Romero & Fang Wu, *Crowdsourcing, Attention, and Productivity*, SOCIAL SCI. RES. NETWORK, Sept. 12, 2008, at 2, <http://ssrn.com/abstract=1266996> (follow "One-Click Download" hyperlink).

43. Chris Satullo, *Crowdsourcing: Idea Power from the People*, PHILA. INQUIRER, Sept. 14, 2008, at A03.

engineering to understand exactly what musicians do as they play.”⁴⁴ Zenph has developed software that translates existing recordings into malleable data, which can then be used in new ways.⁴⁵ In a nationally televised concert with famous violinist Joshua Bell, Zenph’s software played the part of classical pianist Sergei Rachmaninoff on a Steinway piano.⁴⁶ Sony Classical and RCA have recorded and released three CDs with Zenph featuring “re-performances” of three famous deceased artists: jazz pianist Art Tatum and classical pianists Glenn Gould and Sergei Rachmaninoff.⁴⁷ Zenph is now developing the technology for other instruments besides piano and the human voice.⁴⁸ Ultimately, Zenph technology could be used to dissect performances and extract musicians’ artistic DNA, which users could then apply to new music to imitate a musician’s style.⁴⁹

The software that musicians use to produce music is becoming increasingly user-friendly and is providing features that substitute for a user’s lack of professional skills or training.⁵⁰ New applications allow relative novices to create professional-sounding menu-driven music by selecting options from a program menu and adjusting parameters on a digital control panel.⁵¹ UJAM is an online application that allows users to sing or hum a tune directly into their computer’s microphone.⁵² The application then analyzes the melody and produces complex harmonies, drum tracks, bass lines, and more.⁵³ Moreover, users can apply different sound effects and change chords, and the application simultaneously predicts if changing individual notes will have positive or negative effects on the music.⁵⁴ Yamaha has

44. *Company*, ZENPH, <http://www.zenph.com/company> (last visited Mar. 15, 2012).

45. *Technology*, ZENPH, <http://www.zenph.com/company/technology> (last visited Mar. 15, 2011).

46. See Justin Davidson, *Bionic Overload: Can Machine-Made Music Sing Without a Composer?*, N.Y. MAG., Feb. 8, 2010, at 64 (stating that man and machine played the second movement of Grieg’s Sonata No. 3 for violin and piano); Vivien Schweitzer, *A Little Get-Together for Stage and Television*, N.Y. TIMES, Jan. 23, 2010, at C3.

47. See Blair Jackson, *Art Tatum*, MIX, Sept. 2008, at 56; *Shop*, ZENPH, <http://www.zenph.com/shop.html> (last visited Mar. 15, 2012).

48. *Id.*

49. See generally ZENPH, <http://www.zenph.com> (last visited Mar. 15, 2012).

50. See, e.g., UJAM, <http://www.ujam.com> (last visited Mar. 15, 2012); PROPELLERHEAD, <http://www.propellerheads.se/> (last visited Mar. 15, 2012).

51. See, e.g., UJAM, *supra* note 50; PROPELLERHEAD, *supra* note 50.

52. Amy Dusto, *Be a Stay-at-Home Rock Star, If Ujam*, DISCOVERY NEWS (Dec. 29, 2010, 10:11 PM), <http://news.discovery.com/tech/be-a-stay-at-home-rock-star-if-ujam.html>; UJAM, *supra* note 50.

53. Jon Stokes, *An App that Jams with You*, WIRED, Jan. 2011, at 91.

54. UJAMVIDEO, *UJAM Trailer December 2010*, YOUTUBE (last visited Feb. 5, 2012), <http://www.youtube.com/watch?v=TyK2mmFvutk> (demonstrating the capabilities of UJAM).

developed another software application called Vocaloid that is amazingly adept at synthesizing singing from sounds, words, and melody.⁵⁵ As software becomes more sophisticated, it is easy to imagine that it will continue to take on increasing amounts of the technical and creative control associated with music production.

Indeed, many software programs today are capable of generating music without any human musician's expertise, but instead rely solely on a human audience's expertise.⁵⁶

Software such as DarwinTunes and Evoelectronica utilize a programming strategy called genetic algorithms, which generates samples of music from strings of nearly random notes.⁵⁷ Obviously, this initial "generation" does not sound much like music. Soon, however, hundreds, and sometimes thousands of listeners across the Internet rate the music samples, and those that are the most popular are allowed to "reproduce" with one another.⁵⁸ The process involves taking portions from one popular song and combining them with another while adding some random mutations such as instrument substitutions; chord, note, tempo, and volume changes; and sequential track swaps.⁵⁹ The resulting "offspring" are typically better sounding than their "parents."⁶⁰ The software then releases this next generation of music, and the listener-feedback process repeats.⁶¹ Eventually, some rather remarkable music evolves.⁶² This same process, or one involving different

55. See *Vocaloid Demos and Tryout Software*, ZERO-G, <http://www.zero-g.co.uk/index.cfm?Articleid=802> (last visited Mar. 15, 2012) (providing several songs sung by three different, shockingly realistic computer-generated voices: MIRIAM, LEON, and LOLA).

56. Jo Marchant, *Sci Foo: Evolution of Music and a Dancing Cockatoo*, NEWSIDENTIST CULTURELAB (Aug. 2, 2010, 4:27 PM), <http://www.newscientist.com/blogs/culturelab/2010/08/the-experimental-evolution-of-music-and-snowball-the-dancing-cockatoo.html>.

57. See *id.*; DARWINTUNES, <http://darwintunes.org/> (last visited Mar. 15, 2012); *Evolution + Electronica = Evoelectronica*, EVOELECTRONICA, <http://evoelectronica.com/about> (last visited Mar. 15, 2012); *Genetic Algorithm Definition*, OXFORD ENG. DICTIONARY, <http://www.oed.com/view/Entry/77550?redirectedFrom=%22genetic%20algorithm%22#eid3065220>.

58. Marchant, *supra* note 56.

59. *Id.*

60. *Audio Snapshots*, DARWIN TUNES, <http://darwintunes.org/audio-snapshots> (last visited Mar. 15, 2012) (comparing thirty examples of a musical track recorded between generation 0 and 3,060 during the music's evolution).

61. *Let's Evolve Music*, DARWIN TUNES, <http://darwintunes.org/evolve-music> (last visited Mar. 15, 2012) ("When the system receives your rating, it is used to determine whether or not the loop will reproduce and have baby loops, which will eventually be streamed to you for rating.")

62. See *600 Generations*, DARWIN TUNES, <http://darwintunes.org/600-generations> (last visited Mar. 15, 2012) (providing a sound clip of music evolved after 600 generations).

technology—like neural networks⁶³—can be used to develop prose, poetry, and lyrics.⁶⁴

Some software can even “learn” the very subtle characteristics that make particular music preferable to specific individuals. Pandora’s Music Genome Project (“Pandora”) exemplifies this type of technology.⁶⁵ By identifying nearly 400 attributes associated with a certain song, including its melody, harmony, instrumentation, rhythm, vocals, and lyrics, Pandora can respond to user feedback and adjust its delivery of music so as to stream only music that a listener is likely to enjoy.⁶⁶

Although Pandora does not create music, it should be possible to apply the technology underlying its filtering and selection software to improve the overall quality of computer-generated music. The culmination of these technologies will enable the creation of systems capable of generating music on-demand, without any human intervention other than the initial request for music and occasional feedback thereafter. The perfection of this technology will result in the greatest act of disintermediation that the music industry has thus far experienced: no longer will skilled musicians be the exclusive source of music.⁶⁷

While it is true that outsourcing and crowdsourcing may vastly increase the amount of music available with few or no reserved copyrights, compusourcing may produce large quantities of music not subject to copyright at all. To be eligible for copyright, a work must be both original and fixed in a tangible medium of expression.⁶⁸ Works may be fixed directly by the author or with the aid of a machine or device.⁶⁹ Certainly, original “musical works including any accompanying words” created by a human author are protected by copyright.⁷⁰ Nevertheless, even a piece created solely by a computer likely exceeds the low threshold of originality

63. *Neural Network Definition*, OXFORD ENG. DICTIONARY, <http://www.oed.com/view/Entry/126355?redirectedFrom=neural%20network#eid34662156> (last visited Mar. 15, 2012) (“[A]n interconnected system inspired by the arrangement of neurons in the nervous system; a program, configuration of microprocessors, etc., designed to simulate this.”).

64. See, e.g., Tal Vigderson, Comment, *Hamlet II: The Sequel? The Rights of Authors vs. Computer-Generated “Read-Alike” Works*, 28 LOY. L.A. L. REV. 401, 402–03 (1994) (describing an example of computer-generated prose).

65. See *About Pandora*, PANDORA RADIO, <http://www.pandora.com/corporate/> (last visited Mar. 15, 2012).

66. *Id.*

67. See *supra* Part II.A–B.

68. 17 U.S.C. § 102(a) (2010).

69. *Id.*

70. *Id.* § 102(a)(2).

required to be copyrightable.⁷¹ Yet, the United States Constitution only affords copyrights to authors,⁷² and it seems unlikely that a computer could be considered an “author” under current copyright law.

There is substantial evidence that authors must be human beings to be eligible for protections under the Copyright Act.⁷³ For example, the duration of a copyright is defined as “the life of the author and 70 years after the author’s death.”⁷⁴ In the legislative history for the Copyright Act, Congress also refers to the life and death of a work’s author as well as the author’s sex.⁷⁵ In 1979, the Final Report issued by the National Commission on New Technological Uses of Copyrighted Works (“CONTU”) also suggested that human intervention was required for a work to be copyrightable.⁷⁶

However, no court has yet definitively accepted or rejected the possibility that a computer could be an author, and modern commentators are split on the issue.⁷⁷ Some have noted the enormous practical complexities of allocating copyrights among possible owners including software developers, software users, and the software itself.⁷⁸ This issue is made more complex by the marvels of outsourcing and crowdsourcing, which multiply and obfuscate

71. See *Feist Publ’ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 345 (1991) (“To be sure, the requisite level of creativity is extremely low; even a slight amount will suffice.”); see also Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185, 1199 (1986) (arguing that computer-generated works could meet the originality bar).

72. U.S. CONST. art. I, § 8, cl. 8.

73. See, e.g., 17 U.S.C. § 201(b) (2010) (providing the express statutory allowance that employers are considered authors of “works made for hire”); H.R. REP. NO. 94-1476, at 121 (1976).

74. 17 U.S.C. § 302(a) (2010) (changing the standard for works created on or after January 1, 1978).

75. See generally H.R. REP. NO. 94-1476, at 137 (“Computing the term from the author’s death . . .”), 120 (“[I]f each of the authors prepared his or her contribution . . .”).

76. NAT’L COMM’N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT, at 45 (1979), available at <http://digital-law-online.info/CONTU/contu17.html> (“The eligibility of any work for protection by copyright depends not upon the device or devices used in its creation, but rather upon the presence of at least minimal human creative effort at the time the work is produced.”).

77. See 5-5 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 5.01[A] (Matthew Bender & Co. ed. 2010) (stating that in light of the creation of entire novels and books of poetry by computers, “rivers of ink are spilt” in the secondary literature on whether computers can be considered authors for copyright purposes); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1058 (1993).

78. See Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TUL. L. REV. 1675, 1685–86 (1996–1997) (noting that granting a computer authorship rights would imply granting computers the right to transfer copyrights and sue for infringement, as well as violations of Due Process rights under the Fifth and Fourteenth Amendments).

issues of ownership enormously.⁷⁹ Further, others have also observed that the incentive-based purpose for copyright protection, “[t]o promote the Progress of Science and useful Arts,”⁸⁰ is inapplicable to computer-generated works because computers do not require an incentive to create.⁸¹

Given this reasoning, it seems unlikely that music created solely by computers will fall within the protection of intellectual property law.⁸² However, the allocation of copyrights should be of less concern to existing human musicians than the fact that computers will be dramatically out-producing them. Given the massive oversupply of music that full-scale democratization will bring, it seems that the average value of any one work will rapidly approach zero.⁸³

III. THE “NATURAL TALENT” CERTIFICATION MARK

It seems that if there is not already too much music, there soon will be, and most of it will cost almost nothing to create and will be available to consumers for free. Absent scarcity or production cost, very few business models, including pay-per-use,⁸⁴ subscription,⁸⁵ ad-supported,⁸⁶ or “freemium,”⁸⁷ can be profitable. One solution is to reintroduce scarcity and

79. See *supra* Part II.A–B.

80. U.S. CONST. art. I, § 8, cl. 8.

81. Miller, *supra* note 77, at 1066.

82. See Clifford, *supra* note 78, at 1702.

83. See, e.g., H.M. Robertson & W.L. Taylor, *Adam Smith’s Approach to the Theory of Value in 3 ADAM SMITH: CRITICAL ASSESSMENTS* 71, 75 (John Cunningham Wood ed., Routledge 1996) (1984) (“If the commodity be scarce, the price is raised, but if the quantity be more than is sufficient to supply the demand, the price falls.”), available at <http://books.google.com/books?id=B8FY8mo5zX4C&lpg=PA75&pg=PA75#v=onepage&f=false>. To the extent that outsourcing, crowdsourcing, and compusourcing results in music with reserved copyrights, the fact that so much music will exist will drive its value downward.

84. See, e.g., *What is iTunes?*, APPLE, <http://www.apple.com/itunes/what-is/> (last visited Mar. 15, 2012); *Amazon MP3 Store*, AMAZON, http://www.amazon.com/MP3-Music-Download/b/ref=sa_menu_dmusic2?ie=UTF8&node=163856011 (last visited Mar. 15, 2012) (indicating users pay approximately one dollar per song to download an MP3 file).

85. See, e.g., RDIO, <http://www.rdio.com/> (follow “See plans and pricing” hyperlink) (last visited Mar. 15, 2012) (stating that users pay \$4.99 per month for unlimited web streaming and \$9.99 per month for unlimited web and mobile streaming).

86. Users of Pandora get free access to music streaming, but as with radio, users cannot choose specific songs, only stations. See *Is Pandora Free?*, PANDORA RADIO, <http://help.pandora.com/customer/portal/articles/24528-is-pandora-free-> (last visited Mar. 15, 2012). Users hear advertisements between every few songs unless they upgrade to a subscription model. *Id.*

87. See, e.g., Neal Pollack, *The Celestial Jukebox*, WIRED, Jan. 2011, at 74, 78; *Overview*, SPOTIFY, <http://www.spotify.com/us/get-spotify/overview/> (last visited Mar. 15, 2012) (stating

barriers to entry through differentiation. Musicians creating copyrighted works for profit must differentiate their music from the excess of free and un-copyrightable material and convince consumers the distinction is worth a price premium. It may be that one of the lesser-known forms of intellectual property, a “Natural Talent” certification mark,⁸⁸ is best suited to provide this differentiation.

The Natural Talent certification mark is a means to appeal to a consumer’s desire for *authenticity*.⁸⁹ The premium that consumers place on authenticity is evident in the prices of commodities, including original artwork, ethnic food, travel souvenirs, and brokerage advice.⁹⁰ Even sports performances augmented by steroids and growth hormones are disdained because they are perceived as artificial.⁹¹ The demand for authenticity has grown since the industrial revolution and has intensified now that technology can so effectively simulate it.⁹² Producers in other industries have recognized this fact, and many certification marks have been used to differentiate products by virtue of their “mode of manufacture,” whether they are handcrafted,⁹³ produced in a specific place,⁹⁴ produced by people possessing a specific trait,⁹⁵ or produced by people adhering to a specific stan-

that users get free, unlimited access to music streaming from a desktop, but pay extra to save music to a computer or access music from a phone).

88. Lanham Act, 15 U.S.C. § 1127 (2010) (noting that a certification mark refers to a type of mark used by a person other than its owner “to certify regional or other origin, material, mode of manufacture, quality, accuracy, or other characteristics of such person’s goods or services or that the work or labor on the goods or services was performed by members of a union or other organization”).

89. JAMES H. GILMORE & B. JOSEPH PINE II, *AUTHENTICITY: WHAT CONSUMERS REALLY WANT* 1–5 (2007) (arguing that increasingly “authenticity has overtaken quality as the prevailing purchasing criterion, just as quality overtook cost, and cost overtook availability”).

90. Kent Grayson & Radan Martinec, *Consumer Perceptions of Iconicity and Indexicality and Their Influence on Assessments of Authentic Market Offerings*, 31 J. CONSUMER RES. 296, 296 (2004).

91. *See, e.g.*, Kevin Gilligan & Joseph Copizzi, *The Steroid Controversy*, *HARDBALL TIMES* (Dec. 16, 2004), <http://www.hardballtimes.com/main/article/the-steroid-controversy/> (“A player who excels because of steroids is likely to receive from his peers what the playground cheater receives from his: much disdain and little respect.”).

92. Grayson & Martinec, *supra* note 90, at 296; *see also* Shuling Liao & Yu-Yi Ma, *Conceptualizing Consumer Need for Product Authenticity*, 4 INT’L J. BUS. & INFO. 89, 90 (2009).

93. *See, e.g.*, HERBAN ROOTS, U.S. Trademark Application Serial No. 77,942,599 (filed Feb. 23, 2010) (reciting the certification of handcrafted herbal aromatherapy products).

94. *See, e.g.*, PURE CARIBBEAN, U.S. Registration No. 3,755,181 (reciting the certification of goods manufactured and originating in the Caribbean).

95. *See, e.g.*, SERVICE DISABLED VETERAN OWNED SMALL BUSINESS SDVOSB CVE, U.S. Registration No. 4,026,406 (reciting the certification of a business owned by a service-disabled veteran).

dard.⁹⁶ The Natural Talent certification mark would certify music as having been produced substantially through the practiced skills of one or more human beings without the use of corrective technology or technology that substitutes for human creativity, originality, or talent. For the Natural Talent mark to remain effective, it must be administered by a central organization capable of enforcing the standard required by the certification, and it must be available for use by anyone who meets the standard.⁹⁷

There is already evidence that both music fans and the musicians they admire are ready for a Natural Talent certification mark. Lip-syncing is a popular form of technology-assisted cheating: stars like Ashlee Simpson, Britney Spears, Madonna, Milli Vanilli, and even little Lin Miaoke, the nine-year-old girl who lip-synced “Ode to the Motherland” at the opening ceremony of the 2008 Beijing Olympics, have been identified as partaking in the practice and have felt the scorn of fans for having faked their performances.⁹⁸ Currently under attack are Auto-Tune and its brethren of performance-fixing tools that eliminate any trace of authenticity.⁹⁹ In 2002, Allison Moorer released the CD titled *Miss Fortune* with a label that read, “[a]bsolutely no vocal tuning or pitch correction was used in the making of this record.”¹⁰⁰ Other artists have also pledged never to use pitch-correction in their works.¹⁰¹ At the 51st Grammy Awards in 2009, the band Death Cab for Cutie wore blue ribbons to raise awareness of “Auto-Tune

96. See, e.g., CERTIFIED ORGANIC BY CERTIFIED CALIFORNIA ORGANIC FARMERS, U.S. Registration No. 4,031,016 (reciting the certification of “goods . . . organically grown, processed and produced in accordance with the California Organic Food Act of 2003 . . . [and whose] grower, processor or producer practices a program of long term ecological soil management and in the case of meat and poultry, practices a program of stress reduction and good nutrition to maximize animal health”).

97. An organization such as the Songwriters Guild of America, the National Academy of Recording Arts & Sciences, the GRAMMY Foundation, or the Recording Industry Association of America could oversee the Natural Talent certification so long as it does not engage “in the production or marketing of any goods or services to which the certification mark is applied.” Lanham Act § 1064.

98. Greg Kot, *Little Mic Lies: Everyone Does It; Why Nearly All the Stars Use Recordings at Major Events*, CHI. TRIB., Feb. 5, 2009, at C1; Meghan Daum, Editorial, *From the Mouths of Babes*, L.A. TIMES, Aug. 16, 2008, at A21.

99. See e.g., Tony Sclafani, *Oh, My Ears! Auto-Tune Is Ruining Music*, MSNBC TODAY MUSIC (June 2, 2009, 10:01:02 AM), <http://today.msnbc.msn.com/id/30969073/ns/today-entertainment/t/oh-my-ears-auto-tune-ruining-music/>.

100. Maureen Ryan, *What, No Pitch Correction? Raising a Flag on Vocal Effects*, CHI. TRIB. (Apr. 27, 2003), http://msl1.mit.edu/furdlog/docs/2003-04-28_chitrib_pitch_correction.pdf.

101. Michael McCall, *ProTools*, NASHVILLE SCENE, June 10, 2004, <http://www.nashvillescene.com/nashville/pro-tools/Content?oid=1190101> (stating that Martina McBride, Vince Gill, and Trisha Yearwood have pledged not to use pitch-correction technology).

abuse.”¹⁰² Also in 2009, the rapper Jay-Z released the song titled “Death of Auto-Tune,” calling on other rappers to return to the “raw basics,” while Christina Aguilera has been seen wearing a T-shirt with the slogan “Auto-Tune is for pussies.”¹⁰³ Blogs and forums are brimming with scathing comments from listeners about the overuse of Auto-Tune in the industry.¹⁰⁴

Most music fans like to believe that the musicians they pay to hear can actually play their instruments and sing with their real voices. People respect talent and hard work. No one likes to be made a fool of, and technology like Auto-Tune makes consumers feel that musicians and record labels are trying to “trick them.”¹⁰⁵ Today, technology in the music industry mainly corrects pitch and timing problems.¹⁰⁶ However, as computer-generated music becomes more common, entire songs—including lyrics, vocals, and instrumentals—will be produced and released to an unknowing public, who will be unable to distinguish between music created with authentic human talent and works synthesized by machine.¹⁰⁷

IV. CONCLUSION

The universal appeal of music is attributable to more than just the sound that fills our ears. Consumers also value intangibles such as the emotional connection they have with a musician’s back-story—his or her personal history, hopes, fears, and experiences with fame and adversity.¹⁰⁸ Though these factors cannot be automated through open-sourcing, crowd-sourcing, or compusourcing, it will become virtually impossible for all but the very tiny fraction of uber-famous musicians to compete with the flood of free, artificially-produced music to garner the attention necessary to

102. James Montgomery, *Death Cab for Cutie Raise Awareness About Auto-Tune Abuse*, MTV NEWS (Feb. 10, 2009, 1:28 PM), http://www.mtv.com/news/articles/1604710/20090210/death_cab_for_cutie.jhtml.

103. Alex Needham, *Front: Pitch Perfect But Lacking Soul?*, GUARDIAN, Aug. 23, 2010, at 3.

104. See e.g., *Auto-Tune in Glee Songs*, GLEE, <http://www.gleeforum.com/index.php?showtopic=1600> (last visited Feb. 5, 2012) (showing a majority of unfavorable opinions on a *Glee* fan website regarding the use of Auto-Tune on the show); see also Sclafani, *supra* note 99.

105. See generally Michiko Kakutani, *THE YEAR IN REVIEW: The Idea Was Not to Have a New One*, N.Y. TIMES, DEC. 29, 2002, § 2, AT 1 (discussing the growing use of pitch correction and timing adjustment).

106. Ryan, *supra* note 100.

107. *Id.*

108. Jon Ostrow, *How an Emotional Connection Can Create a Cult-Like Fan Base*, BANDZOOGL (June 9, 2011), <http://bandzoogle.com/blog/blogposts/how-an-emotional-connection-can-create-a-cultlike-fan-base-21828.cfm>.

make these intangibles relevant to their success.¹⁰⁹ Musicians, labels, and distributors could use the Natural Talent certification mark on websites, CDs, and promotional material, and as selection criteria in music streaming services as a means to combat the challenges these new technologies pose.¹¹⁰ Such certification would allow consumers to discover and connect with musicians who offer authenticity in their music. Musicians with natural talent could then stand a chance to earn economic rewards from their copyrights because they agree to “keep it real.”

109. *See supra* Part II.A–C.

110. *See supra* Part III.