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THE COST OF MUSIC: HAS DIGITIZATION MADE COPYRIGHT OBSOLETE?

SEAN A. PAGER* & ERIC PRIEST**

Commentators have repeatedly claimed that digital technologies render producers and recording engineers effectively obsolete. Supposedly, any DIY musician with a laptop and GarageBand can make home recordings that sound just as good as professionals in a high-end studio. The result is a dramatic reduction in the cost of music and the barriers to entry. As artists increasingly record and release new tracks entirely on their own, commentators hail the democratization of the music industry.

Copyright skeptics have invoked democratization claims to further their own agenda: They argue that because digital democratization has eviscerated music production costs, artists no longer need copyright protection to recoup their up-front investment. As such, sound recording copyrights may no longer be justified.

Our Article examines the reality underlying such democratization claims. Harnessing both quantitative and qualitative data, we shed empirical light on a debate hitherto

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fueled by theory and anecdotes. Our findings call into question the commercial viability of DIY music. We show that instances of genuine DIY music gaining widespread popularity remain rare—roughly 1% of music appearing in the top 200 weekly charts is self-produced by artists.

Our Article also provides a qualitative context to explain why DIY recordings have failed to gain traction on commercial charts. Drawing on extensive interviews with music industry insiders, we delve into the complexities of the music recording process and explore the hidden pitfalls that hold DIY artists back. Moreover, contrary to the claims of democratization evangelists, we show that the time and costs required to produce commercially competitive music have not have significantly changed in the digital age. Our findings strongly suggest that copyright skeptics have overstated their case: The rationale for the sound recording copyrights in the digital age remain fundamentally intact.

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INTRODUCTION

They say one great song can change the world. But has technology changed the way great songs are made? Commentators present self-made superstars such as Justin Bieber and Lil Nas X as harbingers of a digital revolution: They claim a DIY musician with a laptop and GarageBand can now make home recordings that sound just as good as professionals working in a high-end studio. Bypassing industry gatekeepers will supposedly allow better music to be made at a much lower cost. As entry barriers vanish and costs plummet, many predict the music industry as we know it will be radically democratized.[1]

This democratization of creativity has significant implications for copyright policy. Copyright skeptics argue that technology has largely eliminated the costs of producing and distributing new works. As such, we no longer need copyrights to recoup such up-front investments.[2] This Article probes the reality behind such claims.

Digital democratization's premises remain more asserted than proven. By subjecting its claims to empirical scrutiny, this Article fills a vital gap in this literature. In particular, we harness novel quantitative and qualitative data to assess the extent to which digitally empowered artists can self-produce music that is commercially competitive.[3]

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[1] *See infra* Part I-B–C.

[2] *See infra* Part I-A, C. A copyright-skeptic agenda has long been promoted by the tech industry. Elon Musk recently raised the stakes by tweeting support for full IP abolitionism. *See* Anthony Ha, *Jack Dorsey and Elon Musk Would Like to 'Delete All IP law'*, TECHCRUNCH (Apr. 13, 2025, at 08:12 PT), https://techcrunch.com/2025/04/13/jack-dorsey-and-elon-musk-would-like-to-delete-all-ip-law/ [https://perma.cc/UL48-YT5R].

[3] *See infra* Part I-C.

Democratization proponents often invoke viral success stories. Consider the meteoric rise of Oliver Anthony's country-folk single, "Rich Men North of Richmond" to the top of the Billboard Hot 100 charts in August 2023.[4] It was the first recording ever to debut at number one on the Billboard Hot 100 by an artist without any prior chart history.[5] Instead of following the conventional path of seeking a record label deal and harnessing the content industry's support, Anthony rocketed straight to the top of the charts seemingly all on his own.[6] Some saw his success as a "repudiation of mainstream gatekeepers."[7]

Anthony's account of working class struggles against a nefarious cabal clearly struck a chord with listeners.[8] The song's chronicle of oppression could double as a metaphor for musicians fighting against record label exploitation. On this score, Anthony's breakout success itself provided powerful inspiration that testifies to the power of social media to drive viral hits.[9] Anthony's backwoods production contributed to the track's grassroots appeal, and eschewing a label deal enhanced his bottom-line earnings.[10] Does "Rich Men" augur a future of DIY music production—a world in which the recording industry is rendered obsolete?

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[4] *See* Gil Kaufman, *Oliver Anthony's Historic Climb to the Top: A Timeline of the 'Rich Men North of Richmond' Singer's Rapid Rise*, Billboard (Aug. 30, 2023), https://www.billboard.com/lists/oliver-anthony-music-career-timeline/humble-beginnings/ [https://perma.cc/EP53-5QVA].

[5] *Id.*

[6] Recorded live in Anthony's backyard, "Rich Men" featured Anthony's solo vocals accompanied by his own guitar. *See* Joe Coscarelli and Marc Tracy, *How 'Rich Men North of Richmond' Reached the Top of the Charts*, N.Y. Times (Aug. 21, 2023), https://www.nytimes.com/2023/08/21/arts/music/rich-men-north-of-richmond-oliver-anthony.html [https://perma.cc/6D54-XJAN]. The song's simplicity and homestyle production values were underscored in its YouTube video release; in it, Anthony sings passionately, alone in a backwoods setting, his bushy red-bearded face bristling with emotion as he strums his acoustic resonator guitar to an audience of dogs resting at his feet. *Id.*; radiowv, *Oliver Anthony - Rich Men North of Richmond*, (YouTube, Aug. 8, 2023), https://www.youtube.com/watch?v=sqSA-SY5Hro [https://perma.cc/7TN7-84YK].

[7] Coscarelli & Tracy, *supra* note 6.

[8] Jay Caspian Kang, *A Close Listen to "Rich Men North of Richmond,"* The New Yorker (Aug. 15, 2023), https://www.newyorker.com/news/our-columnists/a-close-listen-to-rich-men-north-of-richmond [https://perma.cc/GG9Y-EG5K]. The song lyrics deplore the inequities of "[o]vertime hours for bullshit pay," inflation, and taxes. *Id.* Anthony attributes the travails of "people like me and people like you" to the indifference and power lust of unnamed politicians and elites—the eponymous "rich men north of Richmond." *Id.*

[9] Coscarelli & Tracy, *supra* note 6

[10] *Id.*; Kaufman, *supra* note 4 (estimating Anthony's take and noting that "[b]ecause Anthony's music is distributed by DistroKid — which charges a flat fee for distribution — and he owns the song, he pockets the whole amount.").

This raises the question: Is "Rich Men" an exemplar or an outlier? To be sure, there is an abundance of DIY music tracks being released via online platforms. In this sense, music production has been democratized, and digital technologies have unquestionably fueled this transformation. However, the extent to which such home-grown productions can compete effectively for mass audiences remains unclear. Techno-evangelists and copy-skeptics claim that viral hits such as "Rich Men" represent an emerging paradigm. Yet, how often do DIY tracks *actually* make it onto the top of the charts?

To answer, we collected data from popular music charts such as the Billboard Hot 100, Spotify, and other sources. Our data shows that instances of genuine DIY creativity making it onto the charts are extremely rare—less than 1% of top 100 tracks charting are DIY productions. These findings suggest that Oliver Anthony's "Rich Men" is indeed an outlier. In fact, the DIY bona fides of Oliver Anthony's track are themselves questionable.[11]

What about the claim that the empowering potential of digital technologies has led to drastic reductions in the costs of recording commercially successful music? Presumably, if DIY tools were so effective and easy to use, no one would pay for recording studios or professional assistance. And if digital technologies really yielded dramatic time-savings compared to analog recording techniques, those who did seek professional studio assistance would expect to pay less and get quicker results. We explored these propositions through qualitative interviews with recording professionals and other industry experts.[12]

These interviews have furnished objective data on the time and costs required to make high quality records—which turn out *not* to have declined as dramatically as commentators claim.[13] To provide context for these findings, we explored the added value that recording professionals bring to the creative

[11] The apparent involvement of Anthony's manager in the recording process casts doubt on whether the track can truly be classified as a DIY production. *See infra* notes 102–105 and accompanying text.

[12] *See infra* Parts III-A–B. Additionally, we supplemented our interviews by referencing external sources (including books, videos, and podcast interviews with top recording professionals) and personal experience. In particular, one of us (Priest) spent a decade as a professional producer, recording engineer, mix engineer, studio owner, and songwriter working with dozens of artists in a variety of genres including rock, R&B, pop, and electronic music. Priest continues to record and experiment with recording software and contemporary tools of the home recordist.

[13] *See infra* Part III-D.

process and sought to understand why a DIY-inclined artist might—or might not—choose to seek professional assistance.[14] The results help to explain why DIY production has failed to gain traction on commercial charts. Finally, we explored the potential for artificial intelligence-based automated recording tools to accelerate the disintermediation and democratization of music.[15] Here too, the hype does not measure up to current reality.

Collectively, our research suggests that the copy-skeptics have significantly overstated their case. The democratization of content creation has made only limited inroads into the process by which commercially viable music is recorded, mixed, and mastered. Most artists still benefit from professional assistance and struggle to produce high quality recordings on their own.[16] Nor is AI necessarily the game changer that some believe.[17] Accordingly, the rationale for copyright as a mechanism to underwrite investment in socially valuable music remains essentially intact in the digital age.

The remainder of this Article proceeds as follows. Part I discusses how digital democratization claims challenge the rationale for copyright and specifically undermine the justification for copyright in sound recordings. Part I concludes, however, by observing that democratization claims remain rooted in anecdotes rather than hard data.

Part II-A addresses this gap empirically by assessing the extent to which music recorded without the aid of outside professionals appears on commercial music charts. Our examination of popular music charting from 2020 to 2023 reveals a striking absence of such "democratized" music: a mere 1% of the 766 unique tracks we examined represent plausibly DIY recordings. The much-heralded digital revolution remains nowhere in sight.

Parts II-B & C then explain why music charts represent a measure of popular taste and describe the increasingly daunting entry barriers that upstart musicians must struggle to overcome. Finally, Part II-D considers the extent to which the marketing clout of major record labels accounts for the edge enjoyed by professional studio recordings in our data. We present further data showing

[14] *See infra* Part III.
[15] *See infra* Part III-B, D.
[16] *See infra* Part III-A–B.
[17] *See infra* Part III-B, D.

that label involvement does not provide a complete explanation: Music released by indie artists operating outside the major labels regularly makes its way onto the charts, including self-released tracks. However, such indie hits are overwhelmingly recorded with professional assistance. In other words, label involvement matters *less* than having professional-quality recordings.

Part III then turns to qualitative data to contextualize our quantitative results. Interviews with industry professionals delve into the complexities of the music recording process and reveal the many pitfalls that home recordists face. Given such challenges, the failure of DIY musicians to record commercial hits should not surprise us. Our findings also establish that, contrary to repeated claims by copyright skeptics, digital technologies have not fundamentally altered the cost of producing commercial-caliber music. Indeed, making a commercially competitive album still typically costs tens of thousands of dollars.[18] In short, the promises of digital democratization remain largely unfulfilled.

Part Four concludes.

I

COPYRIGHT POLICY CONTEXT

A. Traditional Rationale

Copyright protection in the United States is traditionally justified under an incentive rationale. The goal is to incentivize the creation and dissemination of original works of authorship.[19] The exclusive rights that copyright confers encourage both authors and industry intermediaries to invest in producing and commercializing creative works by allowing them to recoup the often-substantial

[18] *See infra* Part III-D.

[19] *See* U.S. CONST. art. I, § 8, cl. 8 (providing authors rights "[t]o promote the Progress of Science and the useful Arts"); Harper & Row Publishers, Inc. v. Nation Enters., 471 U.S. 539, 546 (1985).

up-front costs entailed.[20] As such, copyright protection has long been seen as a vital lynchpin underpinning creative content industries.[21]

B. Digital Democratization

In recent years, the incentive rationale for copyright has been challenged by skeptics. Copy-skeptics and techno-evangelists have advanced a countervailing narrative of "digital democratization."[22] The democratization narrative hails the liberation of creators from dependence on content industry intermediaries through the empowering potential of digital technology. Instead of relying on publishers, record labels, and film studios, DIY creators can produce content easily and inexpensively on their laptops or phones.[23] With generative AI, a few word prompts can generate a fully-formed original work.[24] Creators can then distribute their completed works globally via free online platforms.[25] From there, content discovery tools and social media allow new works to be discovered and widely shared.[26] In this way, creators can bypass industry gatekeepers and present their unvarnished voices to a global audience. Commentators view this as a more authentic, egalitarian process of cultural exchange.[27] By harnessing many more

[20] Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975) ("[C]opyright law … secure[s] a fair return for an 'author's' creative labor … to stimulate artistic creativity for the general public good.").

Without copyright exclusivity, copyists could freely copy the finished works without bearing these up-front costs. Competition from knockoffs would drive down the sale price of the works to the marginal cost of copying, making it impossible for the original creators to recoup their ex-ante investments. *See* William Landes & Richard Posner, *An Economic Analysis of Copyright Law*, 18 J. Legal Stud. 325, 326 (1989).

[21] *See* Sean Pager, *The Role of Copyright in Creative Industry Development*, 10 L. & Dev. Rev. 521, 522–23 (2017).

[22] *See* Sean Pager & Sunawer Aujla, *The Best Comes Later: Copyright, Career Professionals, & Creative Achievement*, 2022 Mich. St. L. Rev. 1101, 1113–14 (2022) (describing the digital democratization narrative and citing representative commentators).

[23] *See*, *e.g.*, Mark Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. Rev. 460, 505–07 (2015); Eric R. Johnson, *Intellectual Property and the Incentive Fallacy*, 39 Fla. St. Univ. L. Rev. 623, 675–79 (2012).

[24] Katrina Geddes, *Engineering Semiotic Democracy*, FIU L. Rev. (forthcoming 2026) (manuscript at 32), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4865510.

[25] *See*, *e.g.*, Lemley, *supra* note 23, at 487; Johnson, *supra* note 23, at 648.

[26] *See* Lemley, *supra* note 23, at 486–88, 495–96; Joel Waldfogel, Digital Renaissance: What Data and Economics Tell Us about the Future of Popular Culture 54 (Princeton Univ. Press 2018).

[27] *See* Yochai Benkler, The Wealth of Networks: How Social Production Transforms Markets and Freedom 15 (Yale Univ. Press 2006) (hailing the emergence of a new "digital folk culture"); Geddes, *supra* note 24, at 32, 35–37 (extolling the "semiotic democracy" that digital technologies empower).

creative minds, democratization is said to encourage innovation.[28] Instead of commercial hacks reworking "simple, trite themes" ad nauseum,[29] we can revel in a "golden age of creativity" or "digital renaissance."[30]

Commentators argue that the democratization of creativity undermines the rationale for copyright policy.[31] As the costs of creativity have plummeted in the new, frictionless world of digitally empowered expression, DIY creators are pumping out unprecedented amounts of creative content. The resultant digital content cornucopia seemingly overturns previous paradigms based on economic scarcity,[32] a process that generative AI is only accelerating.[33] Moreover, much of this creativity is generated through noncommercial motives.[34] Amateur creators create freely out of love and share their work for human fellowship.[35] Economic considerations appear irrelevant, and copyright incentives no longer needed.[36]

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[28] Lemley, *supra* note 23, at 491 ("When it comes to creation, the evidence suggests that we want many different eyes on a problem, not just a few."); *id.* at 491–92 ("[O]pening the door to new creators … doesn't just give us the new works those creators make; it may actually encourage creativity by others. A growing body of economic literature finds that "spillovers"—third-party benefits provided by a work that its creator can't capture—actually drive further innovation. Being around people with good ideas, whether geographically or in a product space, actually makes it more likely that you will have good ideas of your own. So opening up creativity to newcomers may actually make existing creators more productive.").

[29] *Cf.* Darrell v. Joe Morris Music Co., 113 F.2d 80, 80 (2d Cir.1940) (describing the "simple, trite themes … [that] suit the infantile demands of the popular ear").

[30] *See* Joel Waldfogel, *How Digitization Has Created a Golden Age of Music, Movies, Books, and Television*, 31 J. Econ. Persp. 195, 212 (2017); Waldfogel, *supra* note 26, at 304.

[31] *See* Deven R. Desai & Mark A. Lemley, *Scarcity, Regulation, and the Abundance Society* 6 (Stan. L. & Econ. Olin, Working Paper No. 572, 2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4150871; Lemley, *supra* note 23, at 504–05.

[32] Lemley, *supra* note 23, at 470–71.

[33] *See* Geddes, *supra* note 24, at 31 ("[G]enerative models provide amateur creators with unprecedented tools for creative expression.").

[34] Lemley, *supra* note 23, at 487–93.

[35] *See* Dan Hunter & Gregory Lastowka, *Amateur-to-Amateur*, 46 Wm. & Mary L. Rev. 951, 1023–1025 (2004).

[36] Lemley, *supra* note 23, at 505–07; Johnson, *supra* note 23, at 675–79. Copyright skepticism is not solely the product of disinterested academics. A copyright-skeptic agenda has long been actively promoted by the tech industry. Google, in particular, has provided generous funding to support copy-skeptical policy and research. *See*, *e.g.*, Timothy B. Lee, *How Google Money Is Helping Turn the Political Right against Strong Copyrights*, Vox (May 11, 2014, at 17:00 ET), https://www.vox.com/2014/5/11/5707482/how-google-money-is-helping-turn-the-political-right-against-strong [https://perma.cc/59HQ-AFHX]; Danika Fears, *Here's How Google Pays to Influence Public Policy*, NY Post (May 11, 2018, at 14:39 ET), https://nypost.com/2017/07/11/google-pays-for-research-papers-in-effort-to-influence-policy/ [https://perma.cc/UPN2-JXTQ].

That said, it is doubtful that noncommercial creativity alone would suffice to meet society's needs. Consumers express a clear preference for professionally produced works[37]—for good reason: even the most talented amateurs face capacity constraints that restrict their creative ambitions.[38] Professionals can afford to invest more attention to honing individual works and also improve their work quality over time.[39] The question, then, is how society should support professional creativity.

Even copy-skeptics acknowledge there may be an enduring need for copyright to fund the production of certain high-cost content such as blockbuster movies.[40] However, they argue that such examples will increasingly be the exception. Most works will be cheap and easy to create, and, if needed, *ex ante* costs can be recouped through alternative revenue sources even in the absence of copyright.[41]

C. Are Sound Recording Copyrights Still Needed?

The copy-skeptic challenge fueled by digital democratization has assumed special force in the context of commercial music recording. Compared to other forms of creative endeavors such as novel-writing or filmmaking, the intrinsic costs of creating new music are seen as low: a hit song can be written and recorded in a single day whereas novels and feature films still take months or years to complete.[42] Copy-skeptics argue that the main costs of making music used to involve recording

[37] *See* Pager & Aujla, *supra* note 22, at 1114 (discussing consumers' strong preference for professional productions over works by amateur works); *see also infra* Part II-A.2.3 (noting that out of 805 charting music tracks we examined from 2020 to 2023, not a single one was produced by an amateur hobbyist). None is to say that amateur works do not have value outside the market domain. *See* Pager & Aujla, *supra* note 22, at 1119. However, this Article focuses on commercial value.

[38] Pager & Aujla, *supra* note 22, at 1111–13, 1116–18, 1173. For all its promise, generative AI will not fundamentally alter this basic inequality. As with any tool, those who take the time to master it will extract the best results. *See infra* notes 289–297.

[39] Pager & Aujila, *supra* note 22, at 1117–1124, 1142–51.

[40] *See* Lemley, *supra* note 23, at 496; Johnson, *supra* note 23, at 673; Kal Raustiala & Christopher Sprigman, The Knockoff Economy: How Imitation Sparks Innovation 150, 171 (Oxford Univ. Press 2012).

[41] *See* Lemley, *supra* note 23, at 489–90; Michele Boldrin & David K. Levine, Against Intellectual Monopoly 119–20 (Cambridge Univ. Press 2008).

[42] Making a film also typically requires an array of technical and artistic contributors to collaborate over an extended production process. *See* Pager & Aujla, *supra* note 22, at 1112. By contrast, making music is seen as comparatively easy, quick, and cheap to produce using inexpensive tools in DIY fashion. *See*, *e.g.* Raustiala & Sprigman, *supra* note 40, at 171 (describing how hit songs are often written and recorded in a short burst of inspiration).

and distributing physical copies.[43] Now that digitization has allegedly caused these costs to vanish, has the rationale for copyrighting music similarly disappeared?[44]

In a previous era, producing high quality recorded music required professional studios with million-dollar equipment and highly paid technicians to operate them.[45] Completed records then needed to be printed in factories on physical media (vinyl, tapes, CDs) and trucked to warehouses and retail centers.[46] Such production and distribution processes were beyond the reach of individual artists. Accordingly, musicians depended on record labels to furnish the capital and provide the means to record their work and distribute it to consumers.[47] Copyright provided the economic means to pay for it all.[48]

Today, this dependency on intermediaries no longer exists. A musician can strum on her guitar until inspiration strikes and then record a song on her laptop that she releases the same day all by her herself.[49] Using inexpensive tools, today's artists are now equipped with the creative capacity equivalent to a million-dollar studio and can supposedly produce just as high-quality recordings. Or so the claim goes—and claims to this effect are widespread in scholarly literature.[50]

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[43] *See* Johnson, *supra* note 23, at 673–74.

[44] Commercial music is typically subject to two different copyrights: (1) the musical work copyright that songwriters acquire for their original compositions and (2) the sound recording rights that govern musical performances captured in recorded media (as further manipulated through editing, mixing, and mastering processes). *See* 17 U.S.C. §§ 102(a)(2), (7). This Article focuses on copyrights in sound recording, as the realm most directly impacted by digital technologies.

[45] *See* Waldfogel, *supra* note 30, at 198; WALDFOGEL, *supra* note 26, at 46.

[46] *See* Waldfogel, *supra* note 30, at 198.

[47] *See* Jessica Litman, *Real Copyright Reform*, 96 IOWA L. REV. 1, 12 (2010).

[48] *Id.* at 10–12.

[49] Waldfogel, *supra* note 30, at 198–199. With AI, even the guitar is now optional, and some of the inspiration can be outsourced. *See* Johnson, *supra* note 23, at 673; Geddes, *supra* note 24, at 33.

[50] *See*, *e.g.* Lemley, *supra* note 23, at 488 ("High quality music recording no longer requires a trip to a sound studio in Hollywood or Nashville; online tools enable emerging artists to produce a professional recording at a fraction of the previous cost."); Johnson, *supra* note 23, at 673 ("Albums can now be recorded in someone's home, using a personal computer, and they can achieve a quality that not so many years ago would have required a massive recording studio and the involvement of engineers and supporting musicians."); Joel Waldfogel, *And the Bands Played On: Digital Disintermediation and the Quality of New Recorded Music* 8 (July 25, 2012), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2117372 ("An artist can create a recording with a few hundred dollars worth of software, rather than hundreds of thousands of dollars of studio time."); RAUSTIALA & SPRIGMAN, *supra* note 40, at 214–15 ("[M]usicians once had to rely on expensive studios and highly trained engineers to record their music, and big companies to manufacture and distribute

The effects of digital technologies on distribution are seen as no less transformative. With a few simple mouse-clicks, artists can upload their music onto free content hosting platforms that instantly put their work within the reach of millions, if not billions, of potential listeners.[51] Social media and online algorithms replace the promotional functions formerly performed by record labels.[52] As a result, talented artists can go viral virtually overnight. The breakout success of DIY artists such as Justin Bieber—Oliver Anthony's forerunner—is widely cited as blazing a path for wannabe artists to master their own destinies.[53]

To copy-skeptics, now that artists can create, record, and distribute their music inexpensively without the assistance of intermediaries, the need for sound recording copyrights is questionable.[54] Copyright may have been justified in the analog era as the means to recoup the costs of industry intermediaries, but now that digital democratization has disintermediated the recording process, this rationale no longer applies.[55]

Indeed, the evisceration of costs that digital technology supposedly delivers undermines the entire utilitarian calculus for copyright. Copyright skeptics describe costs as essentially disappearing, plunging to a fraction of previous levels, with a "trend line … of steep decline" that is all-but guaranteed to continue.[56]

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it …. All of this has now changed—for the better. With a laptop, artists can produce high-quality recordings on their own, and distribute them easily via the Internet."); Boldrin & Levine, *supra* note 41, at 119, 193.

[51] *See* Lemley, *supra* note 23, at 470 ("Want your music available to a global audience? Click a few buttons and it's done."); Johnson, *supra* note 23, at 673–674 ("Distribution in the music arena has been democratized even more thoroughly than production. Artists can take a home-recorded album and make it available to a worldwide audience over the internet instantly.").

[52] Hunter & Lastowka, *supra* note 35, at 993–98; Lemley, *supra* note 23, at 495–506.

[53] *See*, *e.g.*, Waldfogel, *supra* note 50, at 9 (citing Bieber's self-made success as emblematic of new possibilities); Lemley, *supra* note 23, at 496 (same).

[54] *See, e.g.*, Boldrin & Levine, *supra* note 41, at 105–06 ("With modern Internet distribution and laptop computer 'recording studios,' the cost of producing music is quite low. So, the allegedly large fixed cost to be recouped via monopoly profits is not due to the actual economic cost of producing and distributing the music, which modern technology has cut to a fraction of what it used to be. The large fixed cost that needs to be recouped via monopoly profits seems to be due to the very existence of the system of copyright and large monopolies thriving on it.").

[55] Lemley, *supra* note 23, at 470 ("You no longer need to turn over 80% of your revenues to a major label record company in exchange for the company mass-producing hundreds of thousands of plastic discs and shipping them to retail stores."); Boldrin & Levine, *supra* note 41, at 119.

[56] Johnson, *supra* note 23, at 674; Lemley, *supra* note 23, at 506 ("[I]n a post-scarcity world, high-cost products will increasingly become the exception, not the norm.").

As costs disappear, the rationale for economic incentives via copyright similarly recedes—or so skeptics would have you believe.[57]

Driven by intrinsic motivations, artists will be free to create and indulge their inner passion. Technology has liberated them from a dependency on industry intermediaries and made high quality creative productions accessible even to hobbyists. Musicians can focus on making great music and sharing it with the world. Any remaining recording costs can be offset through alternative revenues. Artists can earn their living by holding concerts, selling t-shirts, or crowdfunding.[58] Accordingly, skeptics argue that music copyrights are either no longer needed or could be drastically pruned in scope.[59]

Eliminating the sound recording copyright would cause music industry revenues to plummet.[60] Yet, copy-skeptics are unfazed. They argue modern music production is no longer dependent on current industry structures.[61] Studios would close, and producers and engineers would have to find new jobs. However, skeptics assure us that we need not weep for such twenty-first century buggy-whip manufacturers. Creativity will survive.[62] And while the recording industry establishment goes the way of the dinosaurs, musicians themselves will flourish in this brave new era of digital democratization. After all, artists only received a small fraction of recording revenues.[63] Digital disintermediation eliminates the wasteful diversion of funds to support a parasitic industry. Liberated from labels and the tyranny of the corporate bottom line, digitally empowered artists will embrace their

[57] Lemley, *supra* note 23, at 507; Johnson, *supra* note 23, at 674.

[58] Lemley, *supra* note 23, at 489; Boldrin & Levine, *supra* note 41, at 159.

[59] *See* Lemley, *supra* note 23, at 495 ("An IP regime based on the idea that reproduction and distribution are costly and need to be encouraged becomes unnecessary in a world where reproduction and distribution become costless.").

[60] *Cf.* Waldfogel, *supra* note 30, at 197 (describing effect of piracy on industry revenues).

[61] Desai & Lemley, *supra* note 31, at 6.

[62] *See, e.g.*, Boldrin & Levine, *supra* note 41, at 106 ("If we were to abolish copyright today we are confident that the most important effect would be a vast increase in the quantity and quality of music available."); Eben Moglen, *Anarchism Triumphant*, First Monday (Aug. 2, 1999), https://firstmonday.org/ojs/index.php/fm/article/view/684/594 [https://perma.cc/58NE-HQJL].

[63] Litman, *supra* note 47, at 12.

new-found creative freedom, and new music will keep flowing without any loss of quality.[64]

Even without repealing the sound recording copyright, copy-skeptics could influence current policy debates in other ways. It is worth noting that the U.S. Copyright Act already discriminates against sound recording copyrights, giving them weaker protection compared to other forms of creativity.[65] Proposed legislation in Congress would eliminate such disparities, and, for example, expand the public performance right for sound recordings to put it on a parity with other copyrighted expression (as is almost universally the case in other countries).[66] Arguments questioning the rationale for sound recording copyrights bear directly on the justifiability of such legislation. After all, if music can be produced cheaply at home, maybe we don't need exclusive rights to pay for it.

Furthermore, the Music Modernization Act of 2018 created for the first time a statutory compensation right allowing music producers and engineers to share in royalties from music streaming.[67] For some, this royalty-sharing provision provided long-overdue compensation to vital creative contributors.[68] From a copy-skeptic standpoint, however, viewed through the lens of digital democratization, such earmarks appear more akin to a rent-seeking boondoggle. Now that software has rendered producers and engineers obsolete, why should society pay for them via copyright law? Needless to say, if the skeptics' views prevail, such compensation rights would be repealed and sound recording copyrights severely pared back or eliminated.

Such a drastic policy reversal demands persuasive justification. Thus far, however, copyright skeptics' claims about digital democratization's commercial

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[64] *Cf.* Waldfogel, *supra* note 50, at 31–32 (presenting empirical evidence that diminished revenues due to piracy has not led to loss of music quality); Glynn S. Lunney, Jr., Copyright's Excess: Money and Music in the US Recording Industry 4–5, 8–10 (2018); Boldrin & Levine, *supra* note 41, at 119.

[65] *Compare* 17 U.S.C. § 106(4), *with* 17 U.S.C. §§ 106(6), 114.

[66] *See* American Music Fairness Act, S. 253, 118th Cong. (2023) https://www.congress.gov/bill/118th-congress/senate-bill/253; *Making Sure Artists Are Paid for Work Is the American Way*, The Hill (Sept. 2, 2022, at 14:00 ET),
https://thehill.com/opinion/congress-blog/3626032-making-sure-artists-are-paid-for-work-is-the-american-way/ [https://perma.cc/7CCZ-XCMY].

[67] Orrin G. Hatch–Bob Goodlatte Music Modernization Act, Pub. L. No. 115–264, 132 Stat. 3676 (2018).

[68] Gabriel J. Fleet, *What's in a Song? Copyright's Unfair Treatment of Record Producers and Side Musicians*, 61 Vand. L. Rev. 1235, 1238–40 (2008).

significance remain largely unproven. To be sure, digital technologies do bring powerful capabilities. Droves of amateur and indie musicians are indeed recording and posting their music online. Indeed, the total volume of music output is mind-blowing: 120,000 newly released tracks are uploaded onto music streaming platforms every day.[69] For aspiring artists, the ability to indulge your creative impulses and share your work with friends is doubtlessly gratifying. Consumers, too, benefit from the expanded array of music offerings; new voices and sounds are bubbling up through diverse pathways that the analog era may have excluded.[70] Indie artists are capturing a growing share of music streaming revenues.[71] Digital democratization is clearly working as advertised to this extent.[72]

Yet, the question still remains: Has digital disintermediation lived up to its hype on the commercial front? Sure, entry barriers to DIY artists have diminished. But just because you can enter doesn't mean you'll succeed. And just because indie artists are getting streamed doesn't mean we should assume their tracks are self-produced. Focusing specifically on DIY musicians, how democratized is the current market? Are DIY records moving the needle in a commercially significant manner? In particular, are people actually listening to DIY music in meaningful numbers?

On this score, the digital democratization narrative rests largely on assertions about capabilities—what DIY artists "can do" in theory, rather than evidence of real-world achievement. Reliable data on commercial outcomes remain notably absent. However, we do know that the majority of DIY music fails to generate significant uptake: around 80% of artists on Spotify garner fewer than 50 monthly listeners.[73] Democratization proponents tout reports of DIY artists "going viral." However, we should hesitate to extrapolate a handful of cherry-picked examples into claims of a viable business model. Moreover, the continued existence of

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[69] Becky Buckle, *120,000 New Tracks Released on Streaming Services Every Day, Report Finds*, MixMag (May 30, 2023), https://mixmag.net/read/120-000-new-tracks-are-released-on-streaming-services-every-day-report-finds-tech [https://perma.cc/M5V2-LXK7].

[70] *See* Waldfogel, *supra* note 30, at 201–08.

[71] *See Our Annual Music Economics Report*, Spotify (Mar. 2025), https://loudandclear.byspotify.com/#takeaway-9 [https://perma.cc/H3DB-6ZD3].

[72] *See* Waldfogel, *supra* note 30, at 206–11.

[73] Tim Ingham, *Nearly 80% of Artists on Spotify Have Fewer Than 50 Monthly Listeners*, Music Bus. Worldwide (Apr. 25, 2022), https://www.musicbusinessworldwide.com/over-75-of-artists-on-spotify-have-fewer-than-50-monthly-listeners/ [https://perma.cc/GB7D-TD9G].

recording studios, producers, and engineers two decades into the digital revolution suggests that both the music industry and musicians themselves see enduring value in professional production processes despite the supposed democratization of music. Do they know something that the copy-skeptics don't?

To shed light on these questions, we examine the key premises underlying the digital democratization narrative empirically, drawing on both qualitative and quantitative findings: do digital tools empower DIY creators to bypass professional assistance and achieve commercially competitive results? If so, the charts should be populated with tracks made via bedroom recordings. We explore this question in Part II. In Part III, we examine whether technology has made recording professionals obsolete.

II
Testing Democratization Claims Empirically

A. Charts Do Not Lie

1. Methodology

To test the theory that digital democratization has precipitated a plethora of successful DIY artists who forgo the use of recording and production professionals, we surveyed multiple U.S. song charts at different points in time from 2020 to 2023. Charts are a well-recognized, standard measure of a song's commercial success. And commercial success signifies popular significance. Music that consumers value and want to listen to has both social and economic utility.[74] As such, charts supply one measure of quality. If DIY recordings really are equivalent to professionally made music in consumers' eyes, we would expect to see such home-brewed tracks showing up regularly on the charts.

To investigate, we sampled data from three major U.S. weekly charts—The *Billboard* Hot 100, the *Rolling Stone* Top 100, and the Spotify Top 200.[75] The

[74] *See infra* Part III-B; Pager & Aujla, *supra* note 22, at 1138 n.154, 1176–77.

[75] We chose weekly charts because the threshold of success to reach them is less than for year-end rankings (posing a lower bar for DIY artists). Note that our data only captures where tracks ranked during the specific weeks we sampled. Some tracks continued their rise up the charts in the following weeks; others were on their way down from prior heights. However, these trajectories remain highly variable to the individual tracks. By examining all tracks charting at a fixed moment in time, we obtained an apples-to-apples comparison based on a specific moment in time.

Billboard and *Rolling Stone* chart methodologies incorporate data on physical and digital sales and streaming activity via online music services.[76] Spotify is the world's largest streaming service, and its Top 200 chart is derived exclusively from its user streaming data.[77]

To address concerns that our data might be missing a bevy of DIY tracks lurking just below the top 100, we collected data for "lower echelon" tracks outside the typical top 100 chart metric most used to identify a week's most popular tracks. First, as noted, our Spotify chart samples extend down to the 200th most popular track, which is as far down as Spotify's publicly available data goes. Second, we sampled two weeks of Rolling Stone's "Trending 25" chart, which ranks newly released songs that achieve the greatest gains in popularity in a given week measured by percentage growth in audio streams.[78] This data provides a snapshot of songs garnering substantial streaming activity but nevertheless sitting outside of the top 100 tracks at the time of the sample.

In all, we sampled the following U.S. charts:

Chart	Weeks Sampled	Positions Sampled
Billboard Hot 100	March 14, 2020 May 16, 2020 August 22, 2020	1–100
Rolling Stone Top 100	October 2, 2020 February 19, 2021	1–100
Spotify Top 200	October 2, 2020 February 19, 2021 February 24, 2023 September 1, 2023	1–200
Rolling Stone Trending 25	October 2, 2020 February 19, 2021	1–25

[76] *See Rolling Stone Charts: Frequently Asked Questions*, Rolling Stone, https://www.rollingstone.com/charts-faq/ [https://perma.cc/HJ7V-RXLV] (last visited Nov. 8, 2025); Billboard Staff, *How Billboard Came to Its Calculations in This Week's Race for the Hot 100 No. 1*, Billboard (May 18, 2020), https://www.billboard.com/pro/billboard-hot-100-number-one-calculations-6ix9ine/ [https://perma.cc/9WPC-XF84] (explaining Billboard's chart also incorporates radio airplay data).

[77] *See* Michelangelo Harris et al., *Analyzing the Spotify Top 200 Through a Point Process Lens*, ArXiv (2019), https://ar5iv.labs.arxiv.org/html/1910.01445 [https://perma.cc/SCS5-KM2N].

[78] *Welcome to the* Rolling Stone *Charts*, Rolling Stone (Jul. 2, 2019), https://www.rollingstone.com/pro/news/welcome-to-rolling-stone-charts-853157/ [https://perma.cc/6FYQ-BZPG].

In total, we surveyed 1,350 chart positions. Because there is considerable overlap between different charts and longitudinally on the same charts (some tracks have sufficient staying power to linger on the chart for months or years), our total dataset of unique tracks is 805.[79] If we exclude the 39 tracks in our sample that only appear on the Trending 25 charts, and instead focus solely on the tracks in our sample that reached the top 200, that subset is 766 unique tracks.

For each track in our dataset, we collected information about the number and role(s) of recording professionals—aside from the artist(s)—involved in the track's recording and production.[80] If a track's featured artist(s) or group members (if the artist was a group) was/were the only individual(s) credited, and if our supplemental research indicated the artist(s) had no prior professional recording experience, we labeled the track "Likely DIY." Conversely, if there was at least one recording professional aside from the artists—a producer, recording engineer, mix

[79] We chose to focus on unique tracks across our sample because we wanted to determine how often DIY tracks make it onto the charts rather than measure their staying power in terms of popularity. In any case, there were only a couple of DIY tracks that charted on multiple weeks in our sample (*see infra* notes 109–112). Even if we had allowed double-counting, the bottom-line percentages we report in our results below would remain largely unaltered. *See infra* Part II-A.2. A slight increase in the total DIY count in the numerator would have been offset by the addition of hundreds of *non*-DIY tracks added to the denominator.

In addition to calculating the total number of unique tracks in our overall dataset (805), we also calculated the number of unique tracks in several subsets, including the number of unique tracks that reached the top 20, top 100, top 200, and so on, to slice the data in diverse ways. This presented a problem when our sampling captured a song moving up or down the charts over time; in such cases, the same song might appear in multiple subsets. We decided that the best way to gain an accurate picture at the subset level was to treat every subset discretely and calculate the number of unique tracks therein, without regard to other subsets. Accordingly, if a track appeared at #1 on one chart, and #85 and #125 on subsequent charts, we counted the track only once for our main dataset of 805 unique tracks, but the same track *would* be counted toward the total in each of the top 20, top 100, and top 200 data subsets. Because this methodology involved double-counting as between these separate subsets, the number of unique tracks comprised by each of our smaller samples cumulatively totals more than the 805 unique tracks in our overall dataset.

In a handful of cases, our dataset included an original track as well as a remix of that track, both of which charted. In those cases, we treated the remixes as separate tracks from the original because the remixes contain separately identifiable sonic material and thus, in our view, count as a different recording. In most cases, the remix also credits different or additional recording professionals. Lastly, we note that we excluded one track from the dataset—"be happy" by Chillhop Bandits (#8 on the Rolling Stone Trending 25 for the week of October 2, 2020)—because we were unable to find sufficient information about the track and its production. *See infra* Appendix for further discussion of "be happy."

[80] We also collected data on the number of songwriters who contributed to each track, not including the artist.

engineer, editor, or mastering engineer—involved in the track's production, then we coded the track as professionally assisted and "Not DIY."[81]

Likewise, we coded tracks as "Not DIY" where an artist was the sole credited recording professional(s) on the track, but they had previous experience working as a recording professional for others. We refer to such cases as "ringers." Our reason for excluding ringers is that the point of our study was to investigate the claim that digital technology empowers anyone to record high-quality music. To be sure, recordings by ringers do qualify as DIY in a broader sense. But an artist with prior experience recording music professionally is definitionally a recording professional and does not fit the prototype of a digitally empowered dilettante at the heart of the democratization narrative.[82] One of the ringer tracks in our database is illustrative: "Gravity (Feat. Tyler the Creator)" by Brent Fayaz and DJ Dahi, which credits DJ Dahi as the only recording professional.[83] At the time "Gravity" was released, DJ Dahi had been a producer for such superstars as Drake, Kendrick Lamar, and Rhianna. A technically "DIY" track by a superstar producer says little about the democratization of recording.

There were only a handful of "ringer" tracks (eight) in our dataset, and—as we discuss below—including these "ringer" tracks would not significantly alter our findings. Moreover, to the extent that our methodology "undercounts" DIY tracks by excluding tracks self-produced by ringers, that number is nearly offset by a corresponding "overcount" of five tracks in the opposite direction resulting from our treatment of "Close Calls" (discussed in the following paragraph). In any case, we will revisit "ringers" and other excluded "Edge Case Rejects" again below when we discuss our findings.[84]

[81] For most of the recordings in our dataset, there was no ambiguity—there were either verifiably experienced professionals involved in the recording process or there were not. We coded a handful of ambiguous cases as either "Close Calls," which we included as "Plausibly DIY," or "Edge Case Rejects," which we excluded. We describe the methodology and rationale for our categorizations below, with additional details provided in the Appendix. *See infra* notes 84–92 and accompanying text; *see also infra* Appendix.

[82] We identified eight "ringer" tracks in our dataset: "Dark Red" by Steve Lacy; "Infrunami" by Steve Lacy; "Not Allowed" by TV Girl; "Shut Up My Moms Calling" by Hotel Ugly; "golden hour" by JVKE; "Big Shot Cream Soda" by $uicideboy$; "Work Out" by J. Cole; and "Gravity (Feat. Tyler the Creator)" by Brent Fayaz and DJ Dahi. *See infra* Appendix for a nuanced discussion of each track.

[83] *See infra* Appendix for a detailed discussion of this track.

[84] *See infra* Part II-A.2.3.

As noted, our departure from a literal definition of DIY recordings cuts two ways. While we coded "ringers" as non-DIY, such exclusions were offset by our inclusion of "Close Calls" in our analysis. The latter category comprised tracks where someone *other than the artist* was credited for the recording, therefore falling outside a literal DIY definition. In a handful of such cases (five), however, we determined that the credited individual had no prior record of professional experience (or their experience was indeterminate). We coded these tracks as "Close Calls" and describe them more fully below.[85] We will refer to both "Likely DIY" and "Close Calls" collectively as "Plausibly DIY" tracks.

A further complication was posed by indie artists who purchased "beats" from producers through online beat marketplaces such as BeatStars or Tracktrain and then layered their own self-recorded vocals over the beat. This represents an increasingly common approach to music production. Moreover, the term "beats" is something of a misnomer. Beat makers usually offer fully produced and mixed songs sans vocals, consisting of full instrumentation and drums.[86] All the artist need do after purchasing a beat is write and record vocals over the pre-produced music bed. Because the beats form the sonic, rhythmic, and musical essence of the track, the beat maker is typically credited as a producer of the artist's finished track.[87] Four tracks that credited the beat maker as the sole producer and recording

[85] *See infra* Part II-A.2. There were two additional tracks that we considered as potential "Close Calls" but ended up coding as "Not DIY" because a producer had been credited and substantial additional evidence suggested these tracks benefitted from extrinsic assistance and advantages inconsistent with the paradigmatic bedroom artist celebrated by the democratization narrative. These two tracks were "Hey, Mickey!" by Baby Tate and "death bed (coffee for your head)" by Powfu (featuring Beadoobee). For a detailed discussion of these tracks and our reasons for coding them as "Not DIY," *see infra* Appendix. We will, however, include these tracks among the "Edge Case Rejects" that we reconsider below in our discussion of aggregate findings. *See infra* Part II-A.2.3.

[86] *See What Is a Beatmaker? (An In-Depth Guide to Music Production)*, Drumloopai, (June 16, 2023), https://www.drumloopai.com/blog/what-is-a-beatmaker/ [https://perma.cc/F3GB-YEXW] (defining a beat maker as an "individual who specializes in creating instrumental tracks, often referred to as beats, which serve as the foundation of a song" and that the beat-making process includes "structuring the beat into sections like verses, choruses, bridges, and breakdowns to build dynamics and maintain listener interest" as well as "mixing and sound design").

[87] For example, Lil Nas X's breakout success with his 2018 #1 hit, *Old Town Road*, was based on a beat he purchased from Dutch beat maker YoungKio. *See* Carl Lamarre, *'Old Town Road' Producer YoungKio on How Lil Nas X's Song Came to Life*, Billboard (Mar. 28, 2019), https://www.billboard.com/music/rb-hip-hop/old-town-road-producer-youngkio-interview-lil-nas-x-8504409/ [https://perma.cc/F3GB-YEXW]. YoungKio is credited on the track as a producer. *Id.*

professional appeared in our sample that were otherwise apparently DIY and therefore posed a classificatory conundrum.[88]

On one view, the clearly commercial nature of beat marketplaces should disqualify any resulting tracks from classification as "DIY" productions. After all, by starting with a prefabricated track as their starting point, the artist is outsourcing the bulk of the production work to a professional vendor who effectively acts as both a producer/engineer and contributing musician. The artist's subsequent addition of vocals is a relatively trivial step in terms of recording complexity.[89] It's also worth noting that the very existence of beat marketplaces is underwritten by copyright law, which protects beat makers against unauthorized appropriation of their work.[90] The flourishing of such markets therefore seems inconsistent with the future of autonomous, self-reliant production that copyright skeptics envision.

However, on a broader view, one can argue that such decentralized markets are perfectly consistent with democratization. Many beat makers operate outside the traditional industry structures dominated by record labels, recording studios, and recording professionals. So long as the beat maker is not a "ringer" with years of professional industry experience, then arguably their contributions to the finished track could still be considered as operating within a DIY paradigm in which one bedroom producer collaborates sequentially with another.

We ultimately decided to err on the side of inclusivity and include tracks based on purchased beats where we could confirm the beat maker themselves lacked an established professional record. This meant that we had to evaluate the prior experience level of the beat maker to determine whether the track meets our criteria for DIY purity. In two cases, the beat producer had a professional track record as a producer; in those cases, we coded the track as "Not DIY" because the track benefitted substantially from the skills of an experienced

[88] The four tracks are "Star Shopping" by Lil Peep, "Lets Link" by WhoHeem, and "Romantic Homicide" and "Here with Me" by d4vd.

[89] *See infra* note 253 and accompanying text.

[90] Beat marketplaces such as BeatStars.com use sophisticated licensing schemes and electronic agreements for beat producers to set use permissions and monetize their works. They also offer education to producers about copyright law and the specifics of copyright licensing agreements. *See* Allison Belcher, *The Ultimate Guide to Music Licenses in BeatStars Studio*, BeatStars Blog (Aug. 8, 2022), https://blog.beatstars.com/posts/understanding-music-licenses-in-beatstars-studio [https://perma.cc/8WH5-GB7D].

professional (akin to ringers).[91] In the two remaining cases, sources indicated that the beat maker/producer was effectively an amateur (in the first case) or lacked an established professional record (in the second).[92] We coded these as "Likely DIY" and a "Close Call," respectively.[93]

We also recorded information about whether the song was self-released by the artist or released by a record label. If a record label released the song, we coded for the type of label involved (major, major imprint, or large, medium, or small independent).[94] However, the involvement of a record label, by itself, did not affect our coding for DIY purity. Similarly, we recorded credits given to outside songwriters (i.e. writers other than the performing artists), but this data did not affect DIY determinations.

As there is no single authoritative music credits database, we primarily used the Apple Music and Spotify credits databases to collect information about recording professionals, songwriters, and labels. We then cross-checked that data against the Jaxsta, Tidal, MusicBrainz, and Discogs music credit databases. In cases where there were discrepancies or incomplete data, we performed broader web searches to gather supplemental or clarifying information about the recording from sources such as music publications, Genuis.com, and Wikipedia.

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[91] The two tracks in this category are "Romantic Homicide" (#21 on Spotify Top 200 for the week of February 24, 2023, and #85 on Spotify Top 200 for the week of September 1, 2023) and "Here with Me" (#28 on Spotify Top 200 for the week of February 24, 2023), both by d4vd. For a detailed discussion of these tracks and our reasons for coding them as "Not DIY," *see infra* Appendix. We will, however, include these tracks among the "Edge Case Rejects" that we reconsider below in our discussion of aggregate findings. *See infra* Part II-A.2.3.

[92] The two tracks such tracks in our dataset are "Star Shopping," recorded by then-unknown Lil Peep, who constructed the track by rapping over a beat produced by newcomer Kryptik, *see infra* note 119 and accompanying text, and "Lets Link" by WhoHeem, utilizing a beat by a producer who appears not to have had a substantial professional track record. *See infra* note 127 and accompanying text.

[93] *See infra* notes 119, 127 and accompanying text.

[94] Our primary objective in classifying independent labels was to differentiate between releases by labels with very substantial resources for developing and promoting artists (major labels and large independents) on one hand, and releases backed by more modest or minimal resources (medium and small independent labels as well as self-releases) on the other. Classifying independent labels as "small," "medium," or "large" is inherently subjective because these classifications are used informally in the music industry, and perceptions of label "size" are influenced by a variety of factors including number of artists on the label roster, the resources the label has to develop and promote the artists, and the popularity or "star power" of the roster artists. We looked primarily at roster size but also considered the other relevant factors when classifying independent labels.

2. *Findings*

In general, nearly all the songs in our dataset reflected heavy reliance on recording professionals. On average, 5.5 professionals (excluding the artist) represented 3.4 roles in the recording process—i.e., producer, recording engineer, editor, mix engineer, or mastering engineer.[95] As these numbers indicate, on average, the songs in our dataset had multiple professionals in some roles. For example, The Weeknd's smash hit "Blinding Lights," which appeared in our dataset in 2020, had ten recording professionals involved (excluding the artist): two producers, four recording engineers, two mixing engineers, and two mastering engineers. We thus counted ten professionals on this track for four roles (producer, recording engineer, mixing engineer, and mastering engineer). Producer was the most common category of professional credited on tracks in our dataset, but most of the tracks in our dataset also employed mixing engineers and mastering engineers.[96]

2.1. *DIY Tracks in the Top 100*

Judging based on our survey of the music making the charts, reports of recording professionals' demise are greatly exaggerated. Digital democratization claims that DIY recordings can compete effectively simply don't hold up—at least not at the highest levels of music consumption.

[95] The median number of recording professionals per track in our dataset was five, representing a median number of four roles in the recording process. We coded for five categories of recording professional: producer, recording engineer, editor, mixing engineer, and mastering engineer. If a track credits an assistant (such as "assistant mixing engineer" or "assistant recording engineer"), we counted that individual under the primary role heading, i.e., mixing engineer or recording engineer. Likewise, we counted more specific credited roles, such as "strings engineer," "vocal recording engineer," "immersive mixing engineer," or "vocal producer," under the relevant primary role heading, i.e., recording engineer, mixing engineer, or producer, respectively. Further, we coded only for roles that were expressly credited. This undercounts the roles performed in many tracks in our dataset, as some individuals credited for generic roles such as "producer" or "engineer" undoubtedly also performed additional tasks such as editing or mixing. Lastly, a handful of tracks credited one or more executive producers. However, we did not count these as recording professionals because such designations do not indicate the kind and level of involvement such individuals had in the recording process.

[96] While our study focuses on recording, it is worth noting that another type of music professional—songwriters—were also prevalent in our sample: the tracks in our dataset on average credited just over three outside songwriters, meaning writers *other than* the performing artist(s). (The median was 3.)

Start by considering the most commercially successful tier of music—tracks appearing in the top 20 on any major US chart: we found *zero* that we could categorize as *unambiguously* DIY. Even if we include "Close Calls," we found only one such recording that reached the top 20: the aforementioned "Rich Men North of Richmond," which, as we discuss below, is an outlier in several ways and poorly fits the standard digital democratization narrative. In other words, out of the 180 chart positions (comprising 122 unique tracks) in our sample that were in the top 20 on a major US chart, none were clearly DIY, and just *one* was Plausibly DIY—amounting to well under 1%. In short, DIY recordings are virtually absent from the hit parade.

DIY recordings fare no better if we expand the dataset to include tracks in the top 100. We found just two Likely DIY tracks and two Plausibly DIY tracks (including "Rich Men") among the 900 chart positions, comprising 549 unique tracks, that we sampled in the top 100 of the Spotify, *Rolling Stone*, and *Billboard* top 100 charts.[97] In other words, at best, DIY tracks account for 0.7% of the unique tracks in our top 100 dataset.

It is worth pausing to contextualize these findings. Commentators have argued for two decades that cheap, accessible digital recording technologies will enable bedroom artists to forgo big production budgets, professional studios, and recording engineers, and still achieve commercial success using little more than their laptops. However, after sampling 549 unique tracks in the top 100, we found zero unambiguously DIY "mega-successes" (those that made it into the top 20) and at most four Plausibly DIY tracks.

[97] As we discuss below, the Likely DIY tracks are "Put Your Records On" by Ritt Momney and "Sugarcrash!" by ElyOtto, and the two "Close Call" tracks are "Rich Men North of Richmond" by Oliver Anthony and "Heading South" by Zach Bryan.

"Likely DIY" and "Close Call" Tracks in the Top 100

Chart(s) Surveyed	Week of	# of Plausibly DIY tracks	Track Title	Artist	Chart Position
Billboard Hot 100	3/14/2020	0	-	-	-
Billboard Hot 100	5/16/2020	0	-	-	-
Billboard Hot 100	8/22/2020	0	-	-	-
Rolling Stone Top 100 / Spotify Top 200	10/2/2020	1	Put Your Records On	Ritt Momney	#84 (Rolling Stone); #28 (Spotify)
Rolling Stone Top 100 / Spotify Top 200 (tracks #1–100)	2/19/2021	1	SugarCrash!	ElyOtto	#82 (Spotify)
Spotify Top 200 (tracks #1–100)	2/24/2023	0	-	-	-
Spotify Top 200 (tracks #1–100)	9/1/2023	2	Rich Men North of Richmond Heading South	Oliver Anthony Zach Bryan	#6 #36

Moreover, as we detail in the following discussion, few of the DIY tracks that we found cleanly fit the paradigm of the DIY artist composing, recording, and launching original hits from their laptop. Two were covers of successful songs, and thus likely buoyed by the popularity of the professionally produced originals. Others that we classified as "Close Calls" involved outside producers, though it was unclear how experienced the producers were.

2.1.1. Top 100 Tracks in Our Dataset Coded as "Likely DIY"

As noted, we found only two "Likely DIY" tracks in the top 100. We classified the following tracks as Likely DIY because, based on available evidence, the artists were not seasoned recording professionals and they handled all recording and production tasks entirely on their own, without outside help.

1. "Put Your Records On" by Ritt Momney (#84 on *Rolling Stone* Top 100 and #28 on Spotify Top 200 charts for week of October 2, 2020). The artist (under his real name, Jack Rutter) is credited as producer, and subsequent research

suggested he handled recording tasks himself and self-released the recording without a label. The track's production features the artist singing over a bed of electronic music and a programmed beat. Based on the track's success, he later signed a major label record deal with Columbia. The recording's popularity was fueled by its inclusion as backing music on a viral TikTok "make-up challenge."[98] "Put Your Records On" is a cover of a 2006 hit by Corinne Bailey Rae that charted on the Billboard Hot 100 and earned a Grammy nomination.

2. "SugarCrash!" by ElyOtto (#82 on Spotify Top 200 for the week of February 19, 2021). "SugarCrash!" is an eighty-second long "hyperpop" song with synths, drum machines, distorted bass, and high-pitched auto-tuned vocals, all reportedly recorded and mixed by the artist using GarageBand software.[99] The artist uploaded the song to Soundcloud in August 2020, and it trended virally on TikTok in 2021, where it was widely used in connection with various memes.[100] All the sources we consulted credited the artist as the producer, mix engineer, and recording engineer, and we found no sources indicating the artist had prior recording experience. No other professionals were credited. Accordingly, we coded this track as Likely DIY.

2.1.2 Top 100 Tracks in Our Dataset Coded as "Close Calls"

We classified the following two tracks in our dataset as "Close Calls" because sources credit an outside producer, but the extent of the producer's professional experience is unclear.[101]

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[98] Josh Glicksman, *Ritt Momney Doesn't Care If His 'Put Your Records On' Cover Is His Only Pop Hit*, Billboard (Nov. 13, 2020), https://www.billboard.com/music/rock/ritt-momney-put-your-records-on-hot-100-interview-9483116/ [https://perma.cc/3QGF-XDRH]. The recording ultimately peaked at #30 on the Billboard Hot 100 chart.

[99] *See* Genius, *ElyOtto "SugarCrash!" Official Lyrics & Meaning | Verified* (YouTube, Apr. 2, 2021), https://www.youtube.com/watch?v=gLgL43A_bCM [https://perma.cc/47WN-8H7N].

[100] *SugarCrash!*, Wikipedia, https://en.wikipedia.org/wiki/SugarCrash! [https://perma.cc/HY3F-M5TL] (last visited Nov. 8, 2025).

[101] A third top-100 track in our dataset—"Sunday Best" by the band Surfaces (#38 on Billboard Top 100 for week of May 16, 2020, #98 on Billboard Top 100 for the week of March 14, 2020, #15 on the Spotify Top 200 for week of October 2, 2020, and #199 on the Spotify Top 200 for week of February 19, 2021)—merited investigation into whether or not it should be categorized as DIY. We ultimately chose to characterize it as "Not DIY" for two reasons. First, the track credits "Biskwiq" as "studio personnel" (presumably acting as recording engineer) and as mastering engineer. Biskwiq had significant recording experience at the time the track was recorded. For example, prior to the release of "Sunday Best," Biskwiq collaborated with one of the Surface band members on that individual's solo project that reportedly amassed tens of millions of

1. "Rich Men North of Richmond" by Oliver Anthony (#6 on Spotify Top 200 chart for the week of September 1, 2023). As discussed above, this track captured the artist performing live with his acoustic guitar outside his farm. The audio was captured on a single microphone. The recording was not self-produced; Anthony's manager, Draven Riffe, produced and engineered the recording, which amounted to setting up the microphone and capturing Anthony's performance, likely with the addition of some basic post-processing (adding equalization, reverb, and dynamic compression).[102] The track was independently released by the artist. Endorsements by conservative politicians helped drive the track's meteoric rise up the charts after Riffe posted the video on YouTube.[103]

We classify this track as a Close Call because it is unclear how much professional experience Riffe had before producing it. Sources suggest Riffe had prior experience as an artist who wrote, recorded, and self-released his own music online. According to Riffe's biography on Spotify, he "gained a small fan base after being recorded by Kanye West in a small bar in Wyoming during a performance."[104] In 2018, Riffe co-founded the YouTube channel where Anthony was first featured, known as Radiowv, "which spotlights unsigned Americana and country acts in the Virginia/West Virginia region."[105] It is clear, therefore, that Riffe had some music industry experience. It is less clear to us, however, the extent to which that experience elevates him to a level above a typical hobbyist producer.

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streams on Spotify. *See Surfaces (Band)*, Wikipedia, https://en.wikipedia.org/wiki/Surfaces_(band) [https://perma.cc/645R-THDN] (last visited Nov. 8, 2025). Second, "Sunday Best" appeared on the band's second album, indicating that they were not neophytes in the studio by the time they tracked "Sunday Best" (indeed, their first album had received enough industry attention that the band signed with Universal Music Group imprint Caroline Records before they released "Sunday Best"). *Id.*

[102] *See* Gary Trust, *Oliver Anthony Music's 'Rich Men North of Richmond' Debuts at No. 1 on Billboard Hot 100*, Billboard (Aug. 21, 2023), https://www.billboard.com/music/chart-beat/oliver-anthony-music-rich-men-north-of-richmond-number-one-debut-hot-100-1235396681/ [https://perma.cc/6A26-8ZZ5]. Anthony wrote on his Facebook page about the recordings, "Draven from RadioWv and I filmed these tunes on my land." Oliver Anthony Music, Facebook (Aug. 17, 2023), https://www.facebook.com/photo/?fbid=253673814164061&set=a.252149744316468 [https://perma.cc/X5M5-AVKM].

[103] *See* Kaufman, *supra* note 4 (noting the song received praise from Joe Rogan, Matt Walsh, Breitbart News, and Georgia Congresswoman Marjorie Taylor Greene).

[104] *Draven Riffe*, Spotify, https://open.spotify.com/artist/6BejhOS7wUuDmAqTfZ85Cu [https://perma.cc/ZV7V-3LRB] (last visited Aug. 4, 2024).

[105] Trust, *supra* note 102.

Importantly, even if one does classify "Rich Men North of Richmond" as DIY, it is an extreme outlier in its level of technical simplicity. A single microphone is the easiest DIY recording imaginable for a hobbyist with modest skill to capture, mix, and master. The approach worked admirably in this case because the intent was to keep the recording as seemingly authentic as possible in keeping with its folksy, blue-collar aesthetic.[106] Although such a simple recording would be within the capabilities of most recording hobbyists, few artists, songs, and genres will find success with this formula. Recordings that consist of a single microphone capturing a live performance are virtually unheard of on the charts. In any event, "Rich Men" is a poor exemplar of digital democratization, since home hobbyists could make comparable single-microphone tape recordings long before the digital revolution.

2. "Heading South" by Zach Bryan (#36 on Spotify Top 200 chart for the week of September 1, 2023). Bryan's backstory is not dissimilar to that of Oliver Anthony. "Heading South" first gained popularity when Bryan, then in the Navy, posted a video on YouTube in 2019 of himself performing the song on an acoustic guitar behind his barracks.[107] He self-recorded his first album (which did not include "Heading South") in an Airbnb with mattresses hanging from the walls.[108] From there he shot to superstardom, but reportedly still eschewed help from established industry professionals, aiming to preserve his grassroots aesthetic.[109] His second album, *Elisabeth*, which included the studio version of

[106] *See* Chris Molanphy, *That Welfare-Bashing Country Song Is Still Atop the Charts, but There's a Silver Lining*, Slate (Sept. 1, 2023, at 14:09 ET), https://slate.com/culture/2023/09/oliver-anthony-rich-men-north-of-richmond-billboard.html [https://perma.cc/UVX4-BBA5].

[107] See Zach Bryan, *Zach Bryan – Heading South* (YouTube, Sept. 7, 2019), https://www.youtube.com/watch?v=d9bmS1UkFBs [https://perma.cc/LXX3-Z7JT].

[108] *See* Casey Young, *On This Date: Zach Bryan Released His Debut Album 'DeAnn' In 2019*, Whiskey Riff (Aug. 24, 2023), https://www.whiskeyriff.com/2023/08/24/on-this-date-zach-bryan-released-his-debut-album-deann-in-2019/ [https://perma.cc/TX22-78HZ].

[109] According to one source, Bryan "turned down several major labels and high profile producers to continue writing music with his rag-tag collection of hometown friends .... Make no mistake, though: the absence of labels, merchandise, and professional equipment is intentional. Bryan loves his music, family, and hometown—and he wants nothing to do with writing a number one hit." *Review: Zach Bryan, "Elisabeth,"* Sputnik Music (June 13, 2020), https://www.sputnikmusic.com/review/81555/Zach-Bryan-Elisabeth/ [https://perma.cc/S33R-M8RE]. Such disclaimers, while possibly sincere, should arguably be read with a grain of salt: disguising the trappings of corporate music professionalism to preserve the perceived authenticity of homespun indie musicians is a well-established marketing strategy. *See* Trigger, *Separating Truth from Fiction in Oliver Anthony's Ascent*, Saving Country Music, (Aug. 21, 2023), https://www.savingcountrymusic.com/separating-truth-from-fiction-in-oliver-anthonys-ascent/

"Heading South" that appeared in our dataset, "was recorded using his laptop in a horse barn behind his house."[110]

"Heading South" is sparsely produced, featuring only Bryan's voice, his acoustic guitar, a rhythm track, and a pedal steel guitar. The credits for "Heading South" list Leo Alba as producer, mixing engineer, and mastering engineer; subsequent research has revealed scant information about Alba's recording experience.[111] One source simply describes him as Bryan's "boss."[112] No other recording credits are provided, although the relative consistency of levels in the recording suggests that a professional mastering engineer may have been involved. Because of the paucity of information about Alba and other contributors, we believe "Heading South" is best categorized as a Close Call.

2.2. *Sampling Lower Echelon Tracks*

When we shift the focus to our "long tail" sample—Spotify chart positions #101–200 and the *Rolling Stone* Trending 25—the frequency of DIY recordings does increase, but not dramatically. Of the 343 unique tracks we sampled in the bottom half of the Spotify charts, we found just two Likely DIY tracks and two Close Calls.[113] Therefore, at best, the percentage of Plausibly DIY tracks in this sample amounts to 1.2%.

Among the fifty Trending 25 tracks we sampled, accounting for 49 unique tracks, we found one Likely DIY track and two Close Calls.[114] The relatively high percentage of Plausibly DIY tracks in this sample—6%—may reflect both the

[https://perma.cc/8E6C-H3RZ] (describing such "astroturf" strategies in the music industry). Perhaps more tellingly, Bryan's 2022 follow-up album, *American Heartbreak*, was recorded under the Warner label and features multiple esteemed producers and nine different engineers. *See Zach Bryan – American Heartbreak*, Discogs, https://www.discogs.com/master/2846653-Zach-Bryan-American-Heartbreak [https://perma.cc/54UK-KX2W] (last visited Nov. 8, 2025).

[110] Sputnik Music, *supra* note 109.

[111] Zach Bryan, *Heading South*, Apple Music (May 8, 2020) https://music.apple.com/us/song/heading-south/1542103681 [https://perma.cc/7PRF-ZT8V].

[112] Young, *supra* note 108. We also found no sources crediting Alba on other artists' works.

[113] The two Likely DIY tracks are "Star Shopping" by Lil Peep and "No Se Va" by Grupo Frontera; the two Close Calls are "Revival" by Zach Bryan and "Lets Link" by WhoHeem.

[114] The Likely DIY track is "Tokyo," by Leat'eq. The Close Calls are "Condemned" by Zach Bryan and "Tooka" by GirlzLuhDev. As noted, we disqualified one of the Trending 25 tracks, "be happy" by Chillhop Bandits, because we could not find sufficient data to determine whether the track was DIY. *See supra* note 79.

small sample size and the idiosyncratic nature of the selection criteria: As noted, tracks made the Trending 25 based on their *relative* rise in popularity, rather than aggregate consumption. In fact, none of the three DIY candidates in our Trending 25 sample ever reached a position on the conventional charts. As such, they can be regarded as outliers.

In any case, of the 388 unique tracks (450 chart positions) in our combined "long tail" sample, we found just seven Plausibly DIY tracks, or 1.8%. We discuss all seven tracks below.

"Likely DIY" and "Close Call" Tracks in Our "Long Tail" Sample

Chart(s) Surveyed	Week of	No. of Plausibly DIY tracks	Track Title	Artist	Chart Position
Spotify Top 200 (tracks #101–200)	10/2/2020	2	Star Shopping Lets Link	Lil Peep WhoHeem	#136[115] #128
Spotify Top 200 (tracks #101–200)	2/19/2021	0[116]	-	-	-
Spotify Top 200 (tracks #101–200)	2/24/2023	1	No Se Va	Grupo Frontera	#157
Spotify Top 200 (tracks #101–200)	9/1/2023	1	Revival	Zach Bryan	#157
Rolling Stone Trending 25	10/2/2020	1	Tooka	GirlzLuhDev	#16
Rolling Stone Trending 25	2/19/2021	2	Condemned Tokyo	Zach Bryan Leat'eq	#16 #15

1. "Star Shopping" by Lil Peep (#118 on Spotify Top 200 for the week of February 19, 2021, #136 on Spotify Top 200 chart for October 2, 2020, and #126 on Spotify Top 200 for February 24, 2023). Lil Peep first posted the track on

[115] "Star Shopping" also appeared in our dataset at #118 on the Spotify Top 200 for February 19, 2021 and #126 on the Spotify Top 200 for February 24, 2023.

[116] As noted above, Lil Peep's "Star Shopping," which we classified as Likely DIY, appeared on this chart at #118. However, since it appeared previously in our dataset, we excluded it from our count on this chart to avoid double-counting.

Soundcloud in 2015, and it enjoyed widespread popularity (ultimately reaching 4x platinum status in the US), especially after its 2019 re-release following the artist's untimely death in 2017. The track credits an outside producer, Krypik (aka Cabe Dixon Brown II), who gave the beat to Lil Peep.[117] The beat is centered around a sampled guitar riff written and recorded by the artist Yppah.[118] It appears that Lil Peep was a relatively unknown artist and Kryptik was a fledgling "bedroom" producer at the time he made the beat, with no verifiable track record of selling beats or other professional experience, so we coded "Star Shopping" as Likely DIY.[119]

2. "No Se Va" by Grupo Frontera (#157 on Spotify Top 200 for the week of February 24, 2023). *Billboard* describes Grupo Frontera as "merely a local band from the Texas border town McAllen, creating music as a hobby and performing at family gatherings" until they self-released several cover recordings in early 2022.[120] Like Ritt Momney's track discussed above, "No Se Va" is a cover (of a 2019 hit single by Colombian group Morat) that achieved viral fame via TikTok.[121] The song was reportedly recorded live in one take.[122] No one is officially credited as producer or engineer on the track, but the song's Wikipedia page credits Grupo Frontera as the sole producer.[123] We found no sources indicating professional help with the recording, so we coded this track as Likely DIY.

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[117] *Lil Peep; Part One*, Lilpeep.com (Sept. 18, 2024), https://lilpeep.com/blogs/posts-by-liza/lil-peep-part-one [https://perma.cc/43VR-F3S4].

[118] *See Lil Peep's 'Star Shopping' Sample of Yppah's 'Never Mess With Sunday'*, WhoSampled, https://www.whosampled.com/sample/504747/Lil-Peep-Star-Shopping-Yppah-Never-Mess-With-Sunday/ [https://perma.cc/SEE8-ZVJD] (last visited Nov. 8, 2025).

[119] *See* Jack Angell, *The Kryptik Interview*, Underground Underdogs, at 03:20 (Mar. 8, 2018), https://undergroundunderdogs.com/2018/03/08/kryptik/ [https://perma.cc/6N5V-BC34] (producer Kryptik stating he "only started to take music seriously" after he connected with Lil Peep, who contacted Kryptik through SoundCloud when both were virtual unknowns).

[120] Jessica Roiz, *Latin Artist on the Rise: How Grupo Frontera Went from a Local Band to the Billboard Charts*, Billboard, (Dec. 22, 2022), https://www.billboard.com/music/latin/grupo-frontera-interview-latin-artist-on-the-rise-1235190705/ [https://perma.cc/F9PV-K4PZ].

[121] *Id.*

[122] Jessica Roiz, *Chartbreaker: How Grupo Frontera Turned a Hobby into a Massive Following in Less than a Year*, Billboard, Nov, 2, 2022, https://www.billboard.com/music/features/grupo-frontera-no-se-va-tiktok-chartbreaker-interview-1235164963/ [https://perma.cc/VLU9-XSV5] (quoting band member as saying, "We practiced ['No Se Va'] three times on a Wednesday, and the next day we recorded it live in one take.").

[123] *No Se Va*, Wikipedia, https://en.wikipedia.org/wiki/No_Se_Va [https://perma.cc/FWU7-ZCCJ] (last visited Jan. 24, 2026).

3. "Revival" by Zach Bryan (#139 on Spotify Top 200 for the week of September 1, 2023). Like "Heading South," "Revival" appeared on Bryan's 2020 album *Elisabeth*, discussed in detail above.[124] Leo Alba is also credited on "Revival" as producer, mixing engineer, and mastering engineer.[125] For the same reasons noted in our discussion of "Heading South," we coded "Revival" as a Close Call.

4. "Lets Link" by WhoHeem (#128 on Spotify Top 200 the week of October 20, 2020). This track credits Micha Armstard (under the moniker LoyalThePlug) as producer.[126] Armstard is a beat maker who as early as 2019 (a year before "Lets Link" was released) was credited on tracks by other artists.[127] Nevertheless, because we could not confirm that Armstard had a professional track record beyond a few prior beat sales, we conservatively coded this track as a Close Call.

5. "Condemned" by Zach Bryan (#16 on *Rolling Stone* Trending 25 for the week of February 19, 2021). Like the other Zach Bryan songs discussed above, this song credits Leo Alba as producer, mixing engineer, and mastering engineer.[128] For reasons noted above, we coded "Condemned" as a Close Call.

6. "Tokyo" by Leat'eq (#15 on *Rolling Stone* Trending 25 chart for the week of February 19, 2021). "Tokyo" is an electronic dance music (EDM) track released in 2018 by Los Angeles-based producer Leat'eq who, according to their Soundcloud page, has been recording and self-releasing music online since as early as 2015.[129] "Tokyo" is a slow dance track consisting entirely of synthesizers and drum machines, with a sampled female voice singing simple, repetitive Japanese

[124] *See* Sputnik Music, *supra* note 109 and accompanying text.

[125] Zach Bryan, *Revival*, Apple Music (May 8, 2020) https://music.apple.com/tr/song/revival/1542103756 [https://perma.cc/FF3Y-8KV9].

[126] *LoyalThePlug*, Genius, https://genius.com/artists/Loyaltheplug [https://perma.cc/BR5Y-42G6] (last visited Oct. 16, 2025).

[127] *See* 4L JAVI, *U*, Genius, (Sept. 23, 2019), https://genius.com/4l-javi-u-lyrics [https://perma.cc/LE8A-RA6P]; WhoHeem, *Let's Link*, Genius, (Aug. 20, 2020), https://genius.com/Whoheem-lets-link-lyrics [https://perma.cc/WB73-VAZC].

[128] Zach Bryan, *Condemned*, Apple Music (Apr. 24, 2019) https://music.apple.com/us/song/condemned/1543705513 [https://perma.cc/S3V6-JDSD].

[129] *See* Leat'eq, Soundcloud, https://soundcloud.com/leateq [https://perma.cc/3V5H-SYQ3] (last visited Sept. 19, 2025).

lyrics. Leat'eq is credited in all production and recording roles.[130] "Tokyo" did not reach any of the U.S. top 100 charts. We coded this track as Likely DIY.

7. "Tooka" by GirlzLuhDev (#16 on *Rolling Stone* Trending 25 for October 2, 2020). This self-released track credits one recording professional, an outside producer using the moniker Prod. Safety.[131] Our research uncovered no other releases that credit Prod. Safety, and we could find no further information regarding their identity or professional experience. Accordingly, we coded "Tooka" as a Close Call.

2.3. *Taking Stock of Our Full Dataset*

In total, of 805 unique tracks (1,350 chart positions) sampled, we found just five Likely DIY tracks—a mere 0.6%. Applying our more lenient criteria to include Plausibly DIY tracks, the count grows to eleven tracks out 805—or 1.4%. However, when we remove the Trending 25 data (whose popularity remains indeterminate) and focus solely on tracks charting in the top 200, the percentage of Plausibly DIY tracks falls to 1%. In other words, a mere 1% of tracks that achieved this key marker of commercial success—reaching the top 200 charts—are DIY.

Moreover, the frequency with which DIY tracks appear remains remarkably consistent no matter how we slice the data: whether we look at tracks in the top 20, top 100, or top 200, we find that Plausibly DIY tracks account for a tiny fraction of the total—1% or less.[132]

Moreover, even if we expand our definition of DIY tracks to include all the twelve Edge Case Rejects we excluded, our findings barely change. Adding back in the eight tracks that were excluded because the artist was a "ringer" with professional recording experience,[133] the two additional tracks where a totality of

[130] *See* Leat'eq, *Tokyo*, SOUNDCLOUD, (2018), https://soundcloud.com/leateq/leateq-tokyo [https://perma.cc/4XA8-P3TC].

[131] *See* GilrzLuhDev, *Tooka (feat. DACHINC)*, (Mar. 17, 2021), https://music.apple.com/tr/song/tooka-feat-dachinc/1576286355.

[132] The only exception applies to our Trending 25 data sample, which, as previously noted, represents something of an outlier given its small sample size and idiosyncratic selection criteria. *See supra* Part II-A.2.2.

[133] *See supra* note 82 and accompanying text. The eight tracks in this category are "Dark Red" by Steve Lacy; "Infrunami" by Steve Lacy; "Not Allowed" by TV Girl; "Shut Up My Moms Calling" by Hotel Ugly; "golden hour" by JVKE; "Big Shot Cream Soda" by $uicideboy$; "Work Out" by J. Cole; and "Gravity (Feat. Tyler the Creator)" by Brent Fayaz and DJ Dahi. *Id.*

circumstances created doubts about the tracks' DIY bona fides,[134] and the two beat-based tracks that we excluded based on the beat maker's professional track record[135] brings the total DIY candidates to just 20 out of 766 in our top 200 sample—or 2.6%. In other words, applying even our least restrictive standard of DIY purity does not meaningfully alter our core finding: DIY success stories remain the rare exception, not the rule.

3. Discussion

The broad takeaway from our data is that it is exceedingly difficult for purely DIY recordings to crack the weekly top 100—an important indicator of commercial viability. Despite the millions of DIY tracks released every year, even reaching the top 200 appears largely beyond reach. As noted, only 1% of the tracks in our sample achieved this milestone.

It is worth examining more closely the Plausibly DIY tracks that we found defying these odds. Some noteworthy commonalities between many of these Plausibly DIY tracks call into question key aspects of the democratization claim.

First, the democratization proponents often tout an emerging paradigm of post-professional creativity dominated by amateurs.[136] It's worth noting that *none* of the Plausibly DIY recordings we identified were released by a "bedroom" hobbyist without aspirations to commercial success. While commentators celebrate a post-scarcity economy in which amateur creators "give away information for free in return for status, benefits to reputation, [or] the value of the innovation to themselves,"[137] evidence for this brave new world remains notably absent in our sample. All the creators of the Plausibly DIY tracks in our dataset recorded their music and posted it online in the apparent hopes of building an audience and leveraging that acclaim to develop a sustainable career as a professional musician. Upon achieving online success, all the DIY creators in our sample whose songs charted in the top 200 pursued full-time music careers; four have signed

[134] *See supra* note 85 and accompanying text. The tracks in this category are "Hey, Mickey!" by Baby Tate and "death bed (coffee for your head)" by Powfu. *Id.*

[135] *See supra* note 91 and accompanying text. The two tracks in this category are "Romantic Homicide" and "Here with Me," both by d4vd. *Id.*

[136] *See supra* notes 34–36 and accompanying text.

[137] BENKLER, *supra* note 27, at 43.

major record deals and two have remained independent but hired Grammy-winning producers for subsequent releases.[138]

Second, most of the Plausibly DIY songs in our dataset are relatively simple productions that newbies with basic knowledge of recording and mixing are more likely to be able to pull off. The tracks involve either vocals and a fairly simple electronic music bed (in the case of "Put Your Records On" and "Tokyo"), heavily incorporate digital samples of other recordings (such as "Star Shopping"), or involve vocals with sparse acoustic instrumentation (in the case of "Rich Men North of Richmond" and "Heading South"). As our interviewees elaborate in Part III, below, such limited musical arrangements typically require less skill and experience to record and mix and thus are more amenable to DIY production. By

[138] After achieving success with "Put Your Records On," Ritt Momney signed a major record deal with Disruptor/Columbia. Glicksman, *supra* note 98. Following the viral success of "SugarCrash!," ElyOtto fielded numerous record deal offers, ultimately signed with RCA, and has released subsequent albums with the major label. Eric Volmers, *After the Sugar Rush: Calgary's Viral Sensation ElyOtto Follows His Own Path with Debut EP*, Calgary Herald (Apr. 29, 2022), https://calgaryherald.com/entertainment/music/after-the-sugar-rush-calgarys-viral-sensation-elyotto-follows-his-own-path-with-debut-ep [https://perma.cc/QA9W-XCXR]; Zach Bryan signed a deal with Warner Bros. Meredith Lawrence, *Zach Bryan's Massive Breakout Year: How The "Something In The Orange" Singer's Authenticity & Defiance Shot Him To Stardom*, Grammy (Feb. 1 2023, at 14:55 ET), https://www.grammy.com/news/zach-bryan-something-in-the-orange-2023-grammys-nominee-american-heartbreak-best-country-solo-performance-heading-south-music-tour [https://perma.cc/ZC7Y-E247]. Oliver Anthony appears to have remained independent but following his viral success with "Rich Men," Anthony's subsequent releases were recorded in a studio with "Nashville superproducer" David Cobb. Matt Wickstrom, *After Viral Fame, Oliver Anthony Bares His Soul with 'Hymnal Of A Troubled Man's Mind': "I Want to Truly Make a Difference"*, Grammy (Apr. 5, 2024, at 14:20 ET), https://www.grammy.com/news/oliver-anthony-music-new-album-interview-hymnal-of-a-troubled-mans-mind [https://perma.cc/49FA-XHPF]. Lil Peep shot to global stardom in the short time between the release of "Star Shopping" and his death from a fentanyl overdose on his tour bus in 2017. *See* Quinn Moreland, *The Lil Peep Documentary* Everybody's Everything *Is a Cautionary Tale of Modern Music Stardom*, Pitchfork (Nov. 14, 2019), https://pitchfork.com/thepitch/lil-peep-everybodys-everything-documentary-review/ [https://perma.cc/PHJ2-F236]. Immediately following their viral success with "No Se Va," Grupo Frontera teamed up with Grammy-winning producer Edgar Barrera and collaborated with Latin superstar Bad Bunny. Thania Garcia, *Hitmaker of the Month Edgar Barrera on Connecting Grupo Frontera with Bad Bunny and the Rise of Música Mexicana*, Variety (Apr. 24, 2023, at 15:04 PT), https://variety.com/2023/music/news/edgar-barrera-grupo-frontera-hitmaker-interview-1235592060/ [https://perma.cc/SG6K-XJMJ]. WhoHeem signed a contract with Columbia following the success of "Lets Link." *See Lets Link*, Wikipedia, https://en.wikipedia.org/wiki/Lets_Link [https://perma.cc/ZM9B-S3A2] (last visited Nov. 9, 2025). Leat'eq's "Tokyo," did not appear in the Top 200 in our sample (only in the Rolling Stone Trending 25), but according to their Soundcloud and Instagram accounts Leat'eq remains active as a DJ and producer. *See* Leat'Eq, *supra* note 129 (EP released in 2025); Leat'eq (@leateq_official), Instagram https://www.instagram.com/leateq_official/?hl=en [https://perma.cc/2XWH-FTS8].

contrast, recordings that feature denser, slicker productions or involve recording live drums, guitars, and other instruments usually outstrip the hobbyist's ability.[139]

The two exceptions in our dataset are Grupo Frontera's "No Se Va" and Zach Bryan's "Revival," which involve recordings of backing vocals and live instruments including drums, guitars, bass, and other instruments. The amateurish quality of the "No Se Va" recording is manifest in the clicky, tinny drum sound, over-indulgent reverbs, and out-of-tune harmony vocals. "Revival" is similarly rough.[140] Nevertheless, the recordings were hits, demonstrating that if a recording goes viral and the song and performance are catchy, a "good enough" production can be good enough. That said, our data does not support the idea that DIY recording is a viable strategy for such bands' success: these are the only tracks in our sample that included a live band but did not apparently utilize recording professionals.

A third important commonality is that two of the DIY tracks in our dataset—"Put Your Records On" and "No Se Va"—are covers. While this does not negate the DIY nature of the recordings, covering an existing hit arguably confers a creative head start because the covering artist can use the prior example as a guidepost for interpretive possibilities. And covering a previously successful hit clearly furnishes a commercial advantage vis-à-vis a DIY artist recording entirely original material. The underlying composition already has proven popular appeal, and the cover version can tap into an existing audience base who may be curious to listen to the new version.[141] While such reinterpretations have their creative merits, they hardly embody the quantum leap in innovation that democratization pundits have promised.[142]

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[139] *See infra* notes 214–215 and accompanying text.

[140] One review of *Elisabeth*, the album on which "Revival" appears, cautions that listeners will "have to fight through the bedroom production to get at the heart of a song—a losing battle for many, but one worth waging for the few who have the patience to endure ...." Sputnik Music, *supra* note 109.

[141] Bri Clark, *The Benefits of Releasing a Cover Song: Gain Exposure with Covers*, Vampr (Nov. 15, 2024), https://vampr.me/blog/the-benefits-of-releasing-a-cover-song-gain-exposure-with-covers/ [https://perma.cc/2ETW-SKAK]. Cover versions of a song also benefit from an algorithmic advantage. Some popular streaming platforms automatically suggest a cover version of a song as an alternative to the original track that the listener requests or has previously enjoyed. *See id.*; *The Benefits of Releasing a Cover Song*, Kami Records (April 13, 2023), https://kamirecords.co/the-benefits-of-releasing-a-cover-song/ [https://perma.cc/389H-LTAG].

[142] *See supra* notes 57–63 and accompanying text.

Fourth, our data indicates that the widespread phenomenon of music "going viral" does not necessarily imply increased opportunities for DIY recordings. First, many of the best-known viral success stories turn out to involve professionally backed productions.[143] Second, while TikTok's rise as a viral launching pad for new music has opened doors for many DIY artists,[144] the revenue opportunities on TikTok remain limited.[145] TikTok reportedly does not share advertising revenue with artists for music used on its site, and it acquires blanket licenses from major content owners for a flat up-front fee.[146] Therefore, for most artists, the financial payoff from TikTok virality needs to come from attracting plays on other platforms.

To be sure, there is evidence that TikTok's ascendance *is* accelerating disintermediation and democratizing the music industry.[147] TikTok gives artists an unprecedented opportunity to promote their works virally and leverage that success into streams and sales.[148] Even major record companies admit that they

[143] Examples include Carly Rae Jepsen's "Call Me Maybe" and Psy's "Gangnam Style," both of which unexpectedly went viral in 2012. Yet, both were already experienced artists who had signed to labels in their home countries (Canada and South Korea, respectively) and produced their recordings and videos professionally. *See* Liz Kang,*'Gangnam Style' at 10: How Psy's Smash Hit Sent Korean Culture Global*, CNN (July 14, 2022, at 21:50 ET), https://www.cnn.com/style/article/psy-gangnam-style-10-years-intl-hnk/index.html [https://perma.cc/L6M6-JUT4]; Lorraine Murray, *PSY*, Britannica (Sep. 11, 2025) https://www.britannica.com/biography/PSY [https://perma.cc/Q7JP-P7X2]; Interscope Records, *Carly Rae Jepsen Signs to Schoolboy Records/Interscope, Run by Scooter Braun and Justin Bieber*, PR Newswire (Feb. 29, 2012, at 06:00 ET), https://www.prnewswire.com/news-releases/carly-rae-jepsen-signs-to-schoolboy-recordsinterscope-run-by-scooter-braun-and-justin-bieber-140841643.html [https://perma.cc/HM8Z-4GA9]. Even Justin Bieber's supposedly DIY breakout success becomes more complicated upon closer examination: Bieber's initially self-released, home-made recordings garnered the interest of professional music manager Scooter Braun, who then arranged for Bieber to professionally re-record and re-release the tracks that ultimately fueled Bieber's meteoric rise to superstardom. *See* Jan Hoffman, *Justin Bieber Is Living the Dream*, N.Y. Times (Dec. 31, 2009), https://www.nytimes.com/2010/01/03/fashion/03bieber.html [https://perma.cc/9KBA-JAH5].

[144] *See, e.g.*, Mia Venkat, *TikTok Has Changed Music — And the Industry is Hustling to Catch Up*, NPR (May 22, 2022, at 05:00 ET), https://www.npr.org/2022/05/22/1080632810/tiktok-music-industry-gayle-abcdefu-sia-tai-verdes-celine-dion [https://perma.cc/GFS7-PMUD].

[145] *See* Eric Priest, *Music Licensing in the Digital Streaming Era*, in The Oxford Handbook of Music Law & Policy (Seán M. O'Connor ed., 2024).

[146] *See* Donald S. Passman, All You Need to Know About the Music Business 143 (11th ed. 2023).

[147] *See* Priest, *supra* note 145.

[148] TikTok appears to be especially well suited to drive virality due to its nature, which prioritizes very short, user-generated videos that often feature a snippet of music. One video can inspire other TikTokers to use the same song in a new video. The song is often ancillary to the video content, putting the video makers (usually third parties) in the driving seat as to which songs get featured. However, being attached to a popular video can be a fast and efficient way to furtively infect millions of unwitting listeners with an "earworm."

have lost power and that TikTok has significantly leveled the playing field for independent artists.[149] Our dataset does include three Likely DIY recordings whose chart success is attributed directly to TikTok (Ritt Momney's "Put Your Records On," ElyOtto's "SugarCrash!", and Grupo Frontera's "No Se Va").[150] Moreover, as we discuss below, the number of *professionally produced* self-releases and independent label releases that chart is increasing.[151]

But despite these increased opportunities, examples of truly homebrewed recordings making it onto the hit parade remain extremely rare. If, for example, we focus on our most recent batch of data, the two weeks of the Spotify Top 200 we sampled in 2023, we find just two Plausibly DIY tracks in the top 50—"Rich Men" and "Heading South," both of which have questionable DIY *bona fides*. When you add in our sampling of tracks ranked 51–200 on the 2023 Spotify charts, the number of Plausibly DIY tracks rises to four out of 324 unique tracks—a mere 1.2%—and one of those tracks ("Revival") is by the same artist who recorded "Heading South." Thus, just three artists were able to land a plausibly DIY recording on the Spotify top 200 during the two weeks we sampled in 2023. And most of those four tracks come with major caveats as noted above: they enjoyed a leg up as covers of popular songs, or they involve styles or limited arrangements that are relatively simple to record and mix, or they benefitted from an extrinsic boost for political reasons ("Rich Men").

B. Are Charts a Reasonable Measure of DIY Success?

The charts provide the only publicly available data on music consumption trends. They are widely accepted as popularity indices for music tracks and have

YouTube, by contrast, features primarily long-form video, with each video typically clocking in at least three minutes and featuring more in-depth content than is usually found on TikTok. When a song is featured in a YouTube video, the song is more likely to be the video's principal focus, rendering the video of little interest to many non-fans.

[149] *See* Alisa Chang, *TikTok Is Creating Music Stars, and the Music Industry Is Watching*, NPR, at 06:40 (Feb. 4, 2022, at 17:04 ET), https://www.npr.org/transcripts/1078337590 [https://perma.cc/8KTV-ACUF] (quoting Atlantic Records' Head of Marketing as saying, "When I first started, [artist promotion] used to be a puzzle for a 3-year-old. You had video and radio … and you just … needed money and leverage and influence as a label. And now, I feel like it's the thousand-piece gray sky [puzzle] where TikTok is the only piece that will individually move the dial the way it does.").

[150] *See supra* notes 98, 99, 120 and accompanying text. The success of "Rich Men North of Richmond" and "Heading South" is attributed more to YouTube. *See supra* notes 103, 107 and accompanying text.

[151] *See infra* Part II-D.

acquired salience as markers of cultural relevance and commercial success.[152] Charts are by no means perfect. They are frequently alleged to be manipulated by industry power players. Furthermore, chart data extends no farther than the top 200 tracks per week and therefore fail to capture most plays in the "long tail" of music consumption.[153] It is important, therefore, to consider whether charts are a reasonable measure of DIY recording success.

Regarding the first issue—whether the charts are inaccurate because they may be manipulated through payola or other means, there is no reason to believe that the charts we consulted are so heavily manipulated that it would materially affect our results. Music charts such as *Billboard* and *Rolling Stone* do routinely face accusations that their methodologies are subject to manipulation by rights owners.[154] Because those charts' methodologies include sales and radio play, allegations of manipulation often revolve around artists or labels artificially goosing sales numbers.[155] It is unclear how pervasive such manipulation might be.

However, the Spotify charts we consulted are not susceptible to such tactics. Because they are based on actual streaming data, they provide a useful comparison to determine how far the "traditional" charts diverge from actual consumption patterns. To be sure, streaming manipulation schemes are widespread, too, using bots and "stream farms" to inflate numbers through "fake" streams or paying for placement on influential playlists (i.e., digital payola).[156] Nevertheless,

[152] *See* Pager & Aujla, *supra* note 22, at 1134, 1176–77.

[153] *See generally* Chris Anderson, The Long Tail: Why the Future of Business Is Selling Less of More (2006).

[154] *See, e.g.*, Dylan Smith, *Billboard Responds to Accusations of Chart Manipulation on Hot 100*, Digital Music News (May 19, 2020), https://www.digitalmusicnews.com/2020/05/19/billboard-responds-chart-manipulation-allegations/ [https://perma.cc/MD3W-3WE5] (noting an accusation that "Ariana Grande and Justin Bieber (or their teams) bought the Hot 100's number-one position for [their duet] 'Stuck with U' chiefly via an alleged last-minute purchase of 30,000 units 'with six credit cards' " and describing *Billboard*'s response to the accusation as "tepid"); *see also* Bryan Rolli, *BTS Aren't Ruining the* Billboard *Charts. They Were Already Broken*, Forbes (June 4, 2021, at 14:52 ET), https://www.forbes.com/sites/bryanrolli/2021/06/04/bts-arent-ruining-the-billboard-charts-they-were-already-broken/ [https://perma.cc/43BV-EN63].

[155] *See* Smith, *supra* note 154.

[156] *See* Ashley King, *What Are Music Streaming Farms – And How Important Are They?*, Digital Music News (July 1, 2022), https://www.digitalmusicnews.com/2022/07/01/what-are-music-streaming-farms/ [https://perma.cc/C893-USTF]; Stuart Dredge, *Spotify Speaks out about Important CNM Fake-Streams Study*, Music Ally (Jan. 20, 2023), https://musically.com/2023/01/20/spotify-speaks-out-about-

fraudulent streams are unlikely to meaningfully distort Spotify's charts because such streams account for a small percentage of overall streams, usually involve back-catalog tracks rather than new releases, and are not generally attributed to charting artists but rather to royalty-skimming fraudsters and unknown artists hoping to manufacture buzz.[157] Moreover, at least one study suggests that digital payola benefits indie artists more than superstars.[158] Admittedly, Spotify does face further suspicions of bias due to the ownership stakes that major labels hold in the service.[159] Such biases plausibly affect the menu of choices that Spotify's algorithmic recommendations and pre-set playlists provide, which could tilt consumption toward label-backed superstars. Even so, the fact remains that Spotify's chart data provide an accurate reflection of what its subscribers are actually listening to.

We therefore argue that, despite their flaws, charts provide a reasonably reliable snapshot of popularity and consumption. Although each chart employs a distinct methodology, with its own strengths and weaknesses, our results remain remarkably consistent across all data sources: DIY artists are virtually non-existent on all of them. Moreover, the charts broadly agree regarding the tracks that *are* represented within a given week: We compared two weeks of *Rolling Stone* Top 100 and Spotify Top 100 chart data and found that they are more than two-thirds identical.[160]

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important-cnm-fake-streams-study/ [https://perma.cc/XBP5-HW8J]; Christopher Buccafusco & Kristelia García, *Pay-to-Playlist: The Commerce of Music Streaming*, 12 U.C. Irvine L. Rev. 805, 808, 828 (2022).

[157] *See* Dylan Smith, *1-3% of France's Total Music Listening Resulted from Fake Streams in 2021, Study Finds: 'These Practices Have Become Widespread'*, Digital Music News (Jan. 18, 2023), https://www.digitalmusicnews.com/2023/01/18/fake-streams-france-study/ [https://perma.cc/XJ62-W88Z] (describing a study by the French government of fraudulent streams and noting that "a miniscule portion of these allegedly non-organic streams reached new releases … skewing instead towards catalog works that debuted at least 36 months back."). Spotify has measures in place to detect billions of fraudulent streams and remove them from its counting statistics. Dredge, *supra* note 156.

[158] *See* Buccafusco & García, *supra* note 156, at 841.

[159] *See* Rebecca Jennings, *The Spotify Conspiracy Theories about "Espresso," Explained*, Vox (July 1, 2024, at 07:30 ET), https://www.vox.com/culture/357907/spotify-sabrina-carpenter-espresso-chappell-roan-algorithm [https://perma.cc/9Q56-BN7A].

[160] This goes to the concern that the chart rankings are not capturing actual consumption behavior. It does not address accusations that listener behavior is itself manipulated by "payola" or other marketing hoodwinks that push label-backed content into prominence on Spotify playlists and/or bias algorithmic mechanisms to selectively boost consumption. Skeptics could still thus argue that "true consumer preferences" in some Platonic sense are being manipulated. However, the fact that many label-backed artists fail to consistently

The second concern is that the charts fail to capture DIY successes in the "long tail" outside the top 200. Our dataset is admittedly constrained by the fact that publicly available data is limited to the top 200 tracks. This data suffices to debunk democratization claims in their strongest form: that anyone equipped with a laptop can become the next Justin Bieber or Oliver Anthony and rocket directly to the top of the charts. But are we missing an important part of the democratization story in the lower echelons of music commerce?

The short answer is that we cannot be sure. However, the data we have does not support the inference that a robust class of successful DIY recordists lurks just outside the top 200. If the numbers of successful DIY recordings steadily increase the farther down the charts one looks, we would expect to have found substantially more DIY tracks in the bottom tier of the charts (chart positions 101–200) than we did in the top 100.

However, somewhat surprisingly, the number of Plausibly DIY recordings in the bottom tier of our dataset (four) equals the number of Plausibly DIY recordings in the top tier. The former dataset comprised a smaller sample of unique tracks; thus, the DIY percentage did increase modestly in the bottom tier (1.2%) compared to the top tier (0.7%). If, however, we just look at our most recent data—the two-week sample of the Spotify Top 200 from 2023—it shows the same number of Plausibly DIY recordings (two) charted in the bottom 100 as in the top 100, in both cases accounting for 1.1% of unique tracks. While it is a relatively small sample size, it does cast doubt on the assumption that over time the number of DIY artists in the bottom tier is increasing.

We did find a higher percentage of DIY tracks in our Trending 25 data. Of 49 unique tracks sampled, we found three Plausibly DIY tracks, representing 6% of the total. As noted, we have no idea how popular these songs actually were (none of the three ever charted), and the small sample size makes it difficult to extrapolate with confidence. Regardless, in all our samples, DIY tracks remain the exception, not the rule. The modest increase in DIY percentage found in the lower echelon data provides little support for the idea that a vast galaxy of successful DIY recordists populate the top 500 or even top 1000 tracks.

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chart, and the fact that indie artists do have success landing on the charts, demonstrate that there are clear limits to such manipulation.

Our qualitative interviews with recording professionals, detailed in Part III-B below, support this conclusion. Our interviewees all have abundant experience working with precisely the type of artist in question: serious home recordists whose tracks are not in the top 200. All our interviewees agreed that in their experience only a tiny percentage of DIY artists – around 5% –can produce, engineer, mix, and master a commercially competitive recording without help.[161] Based on our empirical data and the qualitative experience of these professionals, most of whom work with such artists daily, there are no grounds to presume successful DIY recordists are the norm rather than fringe outliers outside the top 200.

To be sure, there are tens of millions of DIY recordings available on streaming services: 96% of releases in 2023 were independent or self-releases, and doubtless many of those were DIY recordings.[162] We assume that, were we to dig deep enough, at some level we would find a prevalence of DIY recordings. Yet, the exercise would prove little. Most tracks on streaming services receive minimal to no plays. Of the 184 million tracks available to stream in 2023, 158 million – 85% – received between zero and 999 plays.[163] Of those, 46 million (25%) logged *zero* plays.[164] Oceans of DIY recordings that no one listens to have zero cultural impact and provide zero revenue to artists; many represent little more than amateur vanity projects.

Charting songs represent only a minority of the overall market, but they exert a disproportionate influence both commercially and culturally.[165] The precise market share that hit songs collectively enjoy is not publicly known, but our off-the-record

[161] *See infra* note 221 and accompanying text.

[162] Luminate, 2023 Luminate Year-End Music Report 47 (2024).

[163] *Id.* at 46. At 0.5 cents per play, even tracks in the upper end of this range earned miniscule returns: 1000 × $0.005 = $5 – enough to buy a cup of coffee, but not much else. *See* Matt Mullen, *Which Streaming Service Pays Artists the Most Per Stream? Benn Jordan Has Crunched The Numbers – And the Answer Will Surprise You*, Musicradar (Jan. 7, 2025), https://www.musicradar.com/music-industry/streaming-sharing/which-streaming-service-pays-artists-the-most-per-stream-benn-jordan-has-crunched-the-numbers-and-the-answer-will-surprise-you [https://perma.cc/4MBG-5AKN] (reporting Spotify payouts in 2025 as averaging between $0.003 and $0.005 per stream).

[164] Luminate, *supra* note 162, at 46.

[165] Pager & Aujla, *supra* note 22, at 1176–77. Hit songs are often inescapable; they literally provide the soundtrack to our lives. *See id.*; Julie Cohen, *Copyright as Property in the Post-Industrial Economy: A Research Agenda*, 2011 Wis. L. Rev. 141, 148 (2011) ("Mass culture has a value that goes beyond the merely economic; it is what gives us things to talk about with one another, to celebrate or criticize, and to define ourselves against. Many of the examples of spontaneous bottom-up culture that copyright critics (including

communications with knowledgeable record industry insiders indicate that the top 200 charting tracks account for between 5 to 20% of the market in a given week, depending on factors including whether one counts physical and digital sales (in which case the top 200 accounts for about 20%) or streams only (in which case it is closer to 5%). Our own rough estimate, based on publicly available Spotify streaming data, puts the streaming market share for the top 200 tracks at about 8.5% of all plays on Spotify.[166] While an 8-20% market share may seem underwhelming, these 200 songs are competing with over 180 million total tracks available through streaming services, including nearly a century's worth of past hit recordings. The charts thus represent the tracks that are currently most successful at cutting through the noise and attracting listeners. They also, unsurprisingly, command an outsized share of total revenues.

Moreover, the charts are far more reflective of overall consumption than their market share in a given week suggests. The charts are heavily populated by superstars, and superstars account for the vast majority of total streams. Indeed, the top 1% of artists account for more than 90% of all streams, and the top 10% of artists account for a whopping 99.4% of all streams.[167] In other words, although the tracks by Taylor Swift, Drake, Bad Bunny, and the other artists that chart in a given week may account for 10% or less of streams that week, the vast majority of the remaining streams that week are of other songs by those same – and similarly situated – superstars. Indeed, as we discuss below, 75% of streams today are of

myself) celebrate are based on mass culture. It would be hard to imagine, for example, fan fiction detached from its mass-culture substrate.").

[166] We base this rough estimate on publicly available Spotify streaming data. Spotify is the largest streaming service in the U.S. with approximately 36% market share in 2024. *See* Dylan Smith, *The 'Big Three' of Streaming: Spotify, Apple Music, and Amazon Music Now Account for Over 90% of U.S. Subscribers, DMN Pro Data Finds*, Digital Music News (July 5, 2024), https://www.digitalmusicnews.com/2024/07/05/music-streaming-market-share-us/ [https://perma.cc/44P3-5JTK] (ascribing a 36% share of the U.S. music streaming market to Spotify). Spotify publishes charts based on streaming numbers. *See supra* note 77 and accompanying text. We derived this number by dividing 1.4 trillion – the publicly available estimate of total audio streams in the U.S. in 2024 – by 52 weeks, resulting in an average of approximately 27 billion total streams per week. Luminate, 2024 Luminate Year-End Music Report 14 (2025) (reporting 1.4 trillion on-demand audio streams in the U.S. in 2024). Spotify's share of that number—about 36%—results in 9.7 billion streams attributed weekly to Spotify. Spotify's Top 200 tracks account for an estimated 820 million average weekly streams, or 8.5%. We derived the 820 million streams figure by tallying up the total weekly Spotify Top 200 streams for one week out of each month in 2024 and averaging those weekly tallies.

[167] Meredith F. Rose, *Streaming in the Dark: Competitive Dysfunction Within the Music Streaming Ecosystem*, 13 Berkeley J. Ent. & Sports L. 23, 34 (2025).

catalog music – music released more than eighteen months prior. So, most streams are of *former* hits by top artists. But the only way for most artists to reap those tail-end rewards is to chart. Accordingly, the charts give us a clear indication of the kinds of recordings that represent the vast majority of streams.

C. The Nearly Insurmountable Odds of Succeeding with a DIY Recording

Artists have always faced daunting odds launching a viable music career and making a cultural impact. Today's DIY artists, however, face more competition than ever before for an ever-diminishing share of listener ears. If 99.4% of all streams accrue to the top 10% of artists, then the remaining 90% of artists are scrabbling for just 0.6% of total streams.[168]

DIY artists face numerous formidable rivals for that meager 0.6% of remaining streams. They must compete for attention against a never-ending torrent of new music—120,000 new tracks uploaded to streaming services every *day*.[169] Making the odds even longer, much of the residual 0.6% of streams may well be usurped by Spotify's own in-house catalog of mood music playlist-filler, generated by ghost writers or AI and heavily promoted to reduce or eliminate Spotify's royalty payments.[170]

Most dauntingly, any artist uploading music today competes against an almost bottomless reservoir of "catalog" music—i.e., tracks released more than eighteen months prior. Catalog music has steadily eclipsed the market for new releases on streaming services.[171] Seventy-five percent of all plays on streaming services are now catalog tracks, and more than half of all streams are of tracks older than five years.[172] Such consumption includes countless beloved hits and time-honored

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[168] *See id.*

[169] *See* Buckle, *supra* note 69.

[170] *See* Liz Pelly, Mood Machine: The Rise of Spotify and the Costs of the Perfect Playlist 55–57, 73, 126–35 (2025) (describing the huge and growing part of Spotify's streaming business consisting of fungible "mood music," Spotify's deliberate strategy to hire "ghost" composers to write mood music it heavily promotes on playlists with millions of followers, and Spotify's internal aspirations to develop AI music generation, all driven by the company's desire to own as much of its content as possible and minimize outgoing royalty payments).

[171] *See* Will Page, *Does the Music Industry's Definition of 'Catalog' Need an Upgrade?*, Music Bus. Worldwide (Dec. 5, 2017), https://www.musicbusinessworldwide.com/music-industrys-definition-catalogue-need-upgrade/ [https://perma.cc/D82K-BF5H] (observing that the accepted definition of "catalog" in the music industry is tracks released more than eighteen months prior).

[172] Luminate, *supra* note 162, at 45.

favorites by artists who today rank outside the Spotify top 10%. These tracks, too, gobble up precious real estate in the residual 0.6% of streams.

Given these long odds, ensuring a track sounds as appealing as possible assumes make-or-break importance. A few thousand—or even a few hundred thousand—streams will not cut it for most artists seeking to build a sustainable career in music. An artist's track needs millions of plays to generate even modest income to support the artist. At current Spotify royalty rates, an artist needs between 3 and 5 million plays to earn $15,000 – i.e., the poverty line in the United States.[173] In 2023, just one out of every two thousand tracks reached the one-million-stream threshold.[174] This is not to say that musicians today cannot thrive without charting; plenty of mid-level artists manage to earn a decent living.[175] However, the competition has grown increasingly intense at all levels.[176]

In short, while digital democratization has lowered the barriers to entry for indie musicians, it has also increased the competition. How DIY musicians are faring in the long tail market remains uncertain. While streaming data shows that indie musicians enjoy a growing share of the market, indie does not necessarily mean DIY. Indeed, our qualitative interviews with music professionals cast doubt on the commercial viability of DIY recordings. As we discuss in Part III-B, most DIY recordings are marred by basic flaws that undermine their esthetic appeal. Tracks that are sonically substandard fail to land on key tastemaker playlists and compete poorly with professional productions.[177] While there are certainly exceptions, DIY recordists face an uphill battle to succeed.

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[173] *See supra* note 163 and accompanying text (noting that Spotify payouts in 2025 average between $0.003 and $0.005 per stream).

[174] Luminate, *supra* note 162, at 46. This statistic on tracks reaching the million-stream threshold includes recordings by superstars and comprises both new and catalog tracks.

[175] *See* Spotify, Annual Music Economics Report (2025) https://loudandclear.byspotify.com/#takeaway-1 [https://perma.cc/647M-FM8J] ("Thanks to streaming, more artists than ever before are generating royalties at every career stage.").

[176] A recent Spotify report summarizes this paradox. *See id.* ("Streaming has allowed millions to easily share their music globally .... But the sheer volume of uploaders means the fraction who find success appears smaller over time.").

[177] *See infra* Part III-B.

D. Is Record Label Marketing Clout the Real Culprit?

Skeptics may wonder whether the lack of success DIY singles enjoy on the charts reflects less the intrinsic quality of these productions and is rather a testament to the marketing power of the major labels. Copyright skeptics often deplore the "unfair advantage" that Big Media enjoys in the marketplace, pushing their product at the expense of indie and DIY competitors,[178] and, as we saw, critics contend that the music charts are distorted by bias and manipulation.[179] If so, the contest is arguably rigged.[180] Overhyped superstars are triumphing over more talented and deserving indie upstarts.

On its face, even this alternative explanation runs contrary to the digital democratization narrative that anyone can record a DIY song and achieve instant viral success. Our data pours cold water on the claims that social media and online content discovery tools can effectively bypass industry gatekeepers, tastemakers, and traditional marketing campaigns. This reality check on the supposed democratizing effect of social media is supported by a broader 2018 empirical study by Glynn Lunney that similarly found a lack of correlation between the rise of social media and the number of new artists appearing on the Hot 100.[181] Indeed, plenty of evidence suggests that digital markets are just not that democratic.[182]

While marketing may account for some of the major labels' dominant position, we should hesitate to assume that marketing alone explains the success of

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[178] *See, e.g.*, Mark Nadel, *How Current Copyright Law Discourages Creative Output: The Overlooked Impact of Marketing*, 19 Berkeley Tech. L. J. 785, 790 (2004); Neil Netanel, *Market Hierarchy and Copyright in Our System of Free Expression*, 53 Vanderbilt L. Rev. 1879, 1917 (2000).

[179] *See* Smith, *supra* note 154.

[180] *See* Guy Pessach, *Copyright Law as a Silencing Restriction on Non-Infringing Materials: Unveiling the Real Scope of Copyright's Diversity Externalities*, 76 S. Cal. L. Rev 1067, 1071–72, 1091–98 (2003).

[181] Glynn Lunney, Copyright's Excess: Money and Music in the US Recording Industry 140 (2018) ("[T]he suggestion that the rise of social media and reduced barriers to entry in the recording industry, or file sharing itself, has contributed to the discovery of new artists is not supported by this study of the Hot 100 chart. While there are certainly anecdotes that support the notion that new avenues of promotion and distribution have contributed to the success of new artists and new songs, and while these anecdotes may resonate emotionally, the rise of social media did not exhibit a statistically significant correlation with the number of new songs or new artists appearing on the Hot 100 chart.").

[182] *See, e.g.*, Doug Shapiro, *Power Laws in Culture: Why Hits Will Persist in an Infinite Content World*, The Mediator (Mar 16, 2023) https://dougshapiro.substack.com/p/power-laws-in-culture [https://perma.cc/4TNF-FAM7].

major label-backed superstars. The notion that consumer tastes are systematically manipulated by advertising to favor inferior products, while prevalent in the 1960s, has been largely discredited by economists since then.[183] Generally, advertising signals quality.[184] If the public favors label-backed superstars over indie upstarts, it is probably because the former offer music that listeners objectively value.

Record labels are in business to make money. They only back artists whose music they expect to have significant commercial appeal. They do not hesitate to ditch underperforming artists, and they regularly sign new ones (including many of the DIY artists in our sample).[185] They are adept at surfing the cultural zeitgeist and employ a legion of A&R reps to scour bars and honkytonks—and their digital equivalents—in search of new talents and trends. The major labels place multiple bets, knowing that only a few will pay off spectacularly.[186] They also invest considerable resources in grooming artists for commercial success, developing their creative projects, and helping them realize their commercial potential through a well-oiled support structure.[187] The entire process is engineered to deliver hit-quality material, and talented professionals contribute at every stage. Thus, we shouldn't assume that label success relies solely on nefarious manipulation. Intrinsic quality likely plays a role as well.

To be sure, skeptics can still blame copyright for big label dominance. They argue that copyright generates monopoly rents that turbocharge both label marketing and lavish production processes.[188] If so, eliminating copyright could

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[183] *Compare* Ralph Brown, *Advertising and the Public Interest: Legal Protection of Trade Symbols*, 47 YALE L. J. 1165 (1948), *with* Phillip Nelson, *Advertising as Information*, 82 J. POLI. ECON. 729 (1974).

[184] Advertising can signal product quality because consumers perceive that firms that believe in their product expect repeat business and are therefore willing to spend heavily on advertising. *See, e.g.*, Nelson, *supra* note 183, at 732; Paul Milgrom & John Roberts, *Price and Advertising Signals of Product Quality*, 94 J. POLI. ECON. 796 (1986).

[185] *See* ANITA ELBERSE, BLOCKBUSTERS: HIT-MAKING, RISK-TAKING, AND THE BIG BUSINESS OF ENTERTAINMENT 76 (2013). For a discussion of the numerous DIY artists sampled in our chart data who subsequently signed with record labels following their initial self-produced hit, *see supra* note 138.

[186] *Cf.* Jonathan M. Barnett, *Copyright Without Creators*, 9 REV. L. & ECON. 389, 401–03, 408 (2014) (discussing how major intermediaries, including record labels, diversify risk by acquiring "a broad portfolio of creative properties, which improves the likelihood of a positive aggregate return by setting off the losses on flops against the gains on a few hits").

[187] A&R people and producers command a whole retinue of support teams with specialized expertise and resources that can hone and polish the musical and commercial potential of the artist and ensure that their material realizes its highest value. *See* Pager & Aujla, *supra* note 22, at 1125.

[188] *See supra* notes 60–64 and accompanying text; BOLDRIN & LEVINE, *supra* note 41, at 119.

allow indie artists to compete on a more even footing and ensure that creative democratization reaches its full potential.[189]

In fact, while eliminating copyright would certainly reduce industry revenues, the notion that doing so would cause the major labels to loosen their grip on the charts remains questionable. Cultural markets are inherently biased toward superstars.[190] Moreover, evidence in recent decades suggests weakening copyright could have the opposite effect. Declining revenues due to filesharing in the early 2000s led labels to cut back on indie music and double-down on promoting superstars.[191] The winner-take-all character of digital markets further reinforces the commercial potential of top artists.[192] Moreover, labels have negotiated "360-degree" deals that allow them to share in concert revenues and sponsorship deals.[193] These alternative revenue sources still hinge on chart-topping successes, giving labels every incentive to keep pushing their artists upward even in the absence of copyright. In short, eliminating copyright is unlikely to eliminate market biases.

Moreover, the ability of labels to ensure their products' success through sheer marketing muscle should not be exaggerated. Even superstar artists backed by major labels sometimes release duds—albums that bomb in the market notwithstanding well-funded marketing campaigns.[194] Moreover, new distribution platforms are weakening the pillars of label hegemony.[195] Labels used to dominate

[189] *See* Boldrin & Levine, *supra* note 41, at 119. Against this, we should note that copyright also helps indie creators, by undergirding the market for beats that many DIY artists rely on—and, for that matter, encouraging the development of the digital software tools that facilitate DIY recordings.

[190] *See* Michal Shur-Ofry, *Copyright, Complexity, and Cultural Diversity – a Skeptic's View*, in Sean Pager & Adam Candeub, Transnational Culture in the Internet Age 205–06 (2012).

[191] Elberse, *supra* note 185, at 199.

[192] *Id.* at 109, 199.

[193] *Id.*

[194] *See* Alan B. Krueger, Rockonomics: A Backstage Tour of What the Music Industry Can Teach Us about Economics and Life 101–09 (2019) (discussing the role of luck and uncertainty in the music industry and observing that even seasoned industry professionals, "with much at stake and years of experience, have difficulty picking winners"); Evan Sawdey, *Much-Hyped Albums That Were Commercial Disasters*, Yardbarker (Aug. 22, 2025), https://www.yardbarker.com/entertainment/articles/much_hyped_albums_that_were_commercial_disasters/s1_37555367 [https://perma.cc/3FLE-VS28].

[195] *See* Priest, *supra* note 145.

radio top-forty hit parades, but radio's grip on the cultural zeitgeist is declining.[196] Streaming platforms are less susceptible to label manipulation, and indeed, one recent study concluded that playlist payola works to the benefit of indie artists.[197] Further, as noted, the most dynamic music discovery platform, TikTok, operates outside labels' control.[198]

Moreover, while major label-backed releases dominate the charts, tracks that are self-released or backed by smaller indie labels do regularly chart. In our dataset, we coded ten self-released tracks as "Not DIY" recordings. In addition, twenty-two unique tracks on small independent labels and twenty unique tracks on medium-sized independent labels charted. All of these were professionally recorded. Such small to medium labels have much lower marketing budgets than the majors and typically sign lower-profile artists catering to niche genres.[199] Their ability to chart, along with the self-released tracks, belies claims of Big Label hegemony.

In total, we found fifty-two non-DIY (that is, professionally made) recordings that charted without the backing of a major label or large independent label. This fifty-two count total dwarfs the five "Likely DIY" and eleven "Plausibly DIY" tracks in our sample. Accordingly, our data suggests that an artist is between four and ten times more likely to chart with a professionally recorded track released outside the big labels than with a DIY recording. In other words, getting professional help with the recording process matters more than Big Label marketing clout.

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[196] *See* Geoff Mayfield, *As Streaming Dominates the Music World, Is Radio's Signal Fading?*, VARIETY (Feb. 10, 2021, at 07:35 PT), https://variety.com/2021/music/news/radio-signal-fading-streaming-1234904387/ [https://perma.cc/KZN5-S82A].

[197] *See* Christopher Buccafusco & Kristelia A. García, *Pay-to-Playlist: The Commerce of Music Streaming*, 12 U.C. IRVINE L. REV. 805, 810 (2022).

[198] *See supra* notes 148–149 and accompanying text.

[199] Major labels deploy million-dollar marketing campaigns to promote the artists they sign. *See* Ellio Tousley, *Cashstrapped? How to Market Your Music for Under $10K*, DENOVO AGENCY (Apr. 18, 2023), https://denovoagency.com/blogs/insights-and-strategies-for-the-modern-musician/marketing-spends-for-artists-win-without-breaking-the-bank [https://perma.cc/2DJN-K5KU] (citing IFPI data). Indie labels make do with marketing budgets that may be several orders of magnitude less than that. *Id.* As noted, the Big Labels also hold significant equity stakes in Spotify, which allegedly gives them an unfair advantage in promoting their tracks on that platform. *See supra* note 159 and accompanying text. Indie labels and self-releases lack such advantages. Their ability to compete notwithstanding shows that Big Label hegemony remains less than complete.

In sum, marketing may play a role as one factor driving commercial success, but intrinsic quality matters. By quality, we mean music that appeals commercially. That's mostly about musical talent. However, professional recordings play a role as well. The next Part delves deeper into the reasons why recording quality matters. Drawing on qualitative interviews with industry players, we seek to contextualize our chart data. We explore the technical and artistic challenges that DIY artists must overcome to achieve high quality recordings. Our interviews reveal the substantial value that recording professionals bring to the table. These findings help to explain our quantitative findings showing a scarcity of DIY tracks charting in the top 200 and offer reason to doubt the commercial viability of DIY tracks even at lower market echelons.

III
The Enduring Value of Recording Professionals

To explore the current state of play in the commercial music recording industry, we interviewed a wide array of recording industry professionals. Our interviews fill a void in the digital democratization literature, which typically glosses over multi-step processes required to achieve high-quality recordings and elides the complex skillsets required in favor of vague generalizations about the ease and accessibility of home recording software. We aimed to fill that gap by providing a detailed examination of these processes, the distinct roles played by specialized industry professionals who do this work, and the value they deliver.

Accordingly, we spoke to over twenty prominent music industry participants, including producers and engineers, musicians, and record label executives to gain insight into today's digital recording "state of play."[200] Some of these conversations were informal and unstructured. However, our core findings derive from twelve in-depth, semi-structured interviews that we conducted.[201] In particular, we interviewed nine recording professionals and three record label executives. In the

[200] Our interviewees worked in a variety of genres including rock, pop, hip hop, electronica, Latin, jazz, and country music. They also worked with a range of recording budgets, although we generally prioritized interviewees who had experience with lower-budget productions. We supplemented our interviews with our own research examining a variety of sources that discussed the current state-of-play of music recordings.

[201] The interviews typically lasted around 90 minutes and were conducted and recorded via Zoom. We worked off a standard set of open-ended questions but allowed the conversation to flow organically and explore a range of topics and tangents. On a handful of sensitive topics, such as the rates they charged, interviewees sometimes opted to answer off the record.

former category, we chose experienced producers and engineers who regularly work with independent artists and have extensive familiarity with DIY production. We also spoke with three record label executives: one from a major record label and two from independent labels (one large, one small), to gain insight into the importance of recording professionals from the perspective of those who superintend recording project budgets.

Our interviews explored the promise and peril of home-recording, the evolving but enduring need for recording professionals, and the extent to which digital tools have altered the time and costs entailed in producing commercial music. The producers and engineers we spoke with frequently work with indie artists, including home recordists (and are often hired to clean-up the latter's mistakes). Several of them also teach workshops to musicians interested in learning DIY production techniques. Our interviewees also experienced first-hand the transition from analog to digital technology. Their "view from the trenches" provides important insights into the effects of digital technology on the music recording process.

Our interviews with the independent label executives were also revealing. Skeptics might argue that producers and engineers have a vested interest in touting their own value and dismiss major label executives as "dinosaurs" whose lavish budgets insulate them from the winds of digital change. Yet, indie record labels work with much more limited budgets and therefore have a strong interest in reducing recording costs. If DIY recordings could reliably achieve professionally competitive results, one would expect these labels to slash recording budgets and excise unnecessary payments to producers and engineers. Yet they continue to see such expenses as essential to their bottom line.[202] Their accounts and those of the other industry insiders we spoke to help to explain the limited inroads made by digital democratization that we identified in our quantitative data.

[202] In the words of one independent label executive we interviewed, "The goal is for everyone to make money. So, you want to spend enough to make it sound good, but so that you likely will make that money back. And then everyone's happy." Zoom Interview with Christina Johns, Vice President of Operations, Hopeless Records (Aug. 2, 2024) (on file with author).

A. Democratization of Music Recording

As an initial matter, we asked our interviewees whether they agreed with claims made by copy skeptics that the advent of digital technologies has dramatically lowered the time, costs, and skills required to produce commercially competitive music. We then explored this topic with them at greater length to unpack the inquiry into more specific questions and arrive at a nuanced understanding of their views.

The relatively low cost and powerful capabilities of digital recording *tools*—personal computers, software, and digital interfaces—underpins copy-skeptic arguments about democratization.[203] The recording professionals we spoke to all acknowledged the transformative potential that digital tools offered. Indeed, many of them had been early adopters of digital recording. However, when it came to assessing the extent to which such potential had actually led to a democratization of music recording, they offered a fairly consistent account: Overall, they agreed that the democratizing effects of digital technology remained limited.

Our interviewees cited several limiting factors. They emphasized that recording technology alone cannot produce great music. They further explained that: (1) modern recording tools and techniques are complex and difficult to master; (2) the music recording process is not algorithmic; and (3) experience and innate aptitude matter immensely—far more than the actual tools.

First, the process of recording, mixing, and mastering music is both technical and creative. Our interviewees all noted that these tasks cannot be

[203] *See, e.g.*, Raymond Shih Ray Ku, *The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology*, 69 U. CHI. L. REV. 263 (2002) ("Today, [inexpensive personal computers and recording software] enable a musician to record music at home with almost the same acoustical quality as music recorded in a professional studio. Similarly, a competitive professional home recording studio can be built for approximately $30,000, giving artists even greater flexibility to record their own music. Accordingly, recouping the fixed costs of recording music may not be as much a concern as the opportunity costs associated with pursuing a career as an artist rather than as a doctor or an investment banker."); WALDFOGEL, *supra* note 26, at 58 (arguing that music production is now far less costly than in the twentieth century because "an artist can create a recording with a few hundred dollars' worth of software and inexpensive hardware"); RAUSTIALA & SPRIGMAN, *supra* note 40, at 171 ("Musicians once had to rely on expensive studios and highly trained engineers to record their music, and big companies to manufacture and distribute it .... All of that has now changed—for the better. With a laptop, artists can produce high quality recordings on their own, and distribute them easily via the Internet."); BOLDRIN & LEVINE, *supra* note 41, at 119 ("With modern Internet distribution and laptop computer 'recording studios' the cost of producing music is quite small.").

reduced to a mechanical formula. Both the production and mixing processes, in particular, require engaging in a complex array of creative choices that, done well, can significantly enhance the final product.[204] Different recording professionals starting with identical inputs will arrive at very different solutions.[205] Their creative inputs contribute meaningfully to whether or not a song reaches its full potential.

Second, modern recording technologies are powerful, but their power lies in the sophisticated capabilities and the extensive menu of controls, settings, and options they offer.[206] Unleashing these capabilities to their full effect is neither simple nor intuitive. To be sure, artists can go with default settings or presets. But there are no one-size-fits-all solutions.[207] Indeed, part of the challenge is choosing the right tools or settings for the specific project at hand to create a desired effect or accentuate a mood or feeling.

This points to the third limiting factor: the role that innate ability and experience plays. Our interviewees emphasized that what matters most is not the tools, but the person wielding them.[208] You can buy Jimi Hendrix's guitar, but that

[204] *See, e.g.*, Written Comments by Interviewee Mikael "Count" Eldridge, (Dec. 15, 2020) ("The mixing phase is both highly creative and highly technical, and is arguably the single most important part of the process that makes the end product sound 'finished' or 'professional.' A good mixer can make a poor-quality recording sound good in many cases. On the other hand, an inexperienced mixer can make a good recording sound terrible.").

[205] Examples abound on YouTube of musicians who hire multiple engineers at varying price points to mix the same song from the same multitrack recording. The results typically vary considerably and demonstrate a wide range of creative contributions and skill. *See, e.g.*, Hardcore Music Studio, *I Paid 4 Mixers to Mix the Same Song … The Difference is Shocking* (YouTube, Aug. 14, 2023), https://www.youtube.com/watch?v=FL2PQPjnqmg [https://perma.cc/374V-ZZHE].

[206] Pro Tools and Ableton are among the leading providers of digital audio workstation (DAWs).

[207] No serious visual artist would follow a paint-by-numbers kit. Similarly, recording professionals approach each creative project on its own terms, dictated by the song and the vision of the artist or producer. Experimenting and playing with possibilities are vital to achieving excellence.

[208] As producer/mixer Count commented, "There are billions of people with smart phones that have the capability of shooting movies, but does that mean that there are billions of filmmakers as good as Martin Scorsese or Francis Ford Coppola? … Just because someone has a laptop, doesn't mean they can be the next Radiohead. The skills required to use these tools are what take the most time, not the actual act of siting down and recording a song. The skills needed in order to use these new digital tools to their fullest still require many years to master." Zoom Interview with Mikael "Count" Eldridge, Producer, Recording Engineer, Mixer, Remixer, Mastering Engineer (Dec. 15, 2020) (on file with author).

doesn't mean you can play like Jimi.[209] Similarly, mastering the art of recording requires specific skills and abilities that remain just as elusive in the digital age as they did in the days of eight-track cassettes and vacuum tubes. Much of this ability comes only with experience.[210] Almost all our interviewees referred to the 10,000 hours or ten-years-to-mastery rule—the idea that mastering any new task requires repeated practice and dedication.[211] They further described this learning curve as functioning along multiple dimensions.

In part, it's about learning *how* to manipulate the controls and options effectively to achieve desired effects. But technical proficiency only gets one so far. Shepherding a recording to its full potential also requires creativity and musicality. It is about knowing *what* can be done, being alert to possibilities, and knowing *when* to make a particular choice and *why*. It means learning when to break the rules—going outside the box to conjure up something surprising and unexpected that makes for a memorable record.

Achieving quality results often requires improvising and problem-solving. Doing this well requires the ability to listen critically and understand what is working and what is not, which is a specific skill in of itself.[212] Moreover, creative choices do not function in a vacuum. Experience teaches *which* elements play well with others and how to use effects to enhance an overall vibe without being jarring.

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[209] We heard different variations on this idea; one interviewee put it more baldly: "Anyone can pick up a guitar and play it badly." Zoom interview with Larry Crane, Producer, Mix Engineer, Owner of Jackpot! Recording Studio, and Co-Owner and Editor of *Tape Op Magazine* (Dec. 11, 2020) (on file with author).

[210] Interview with Mikael "Count" Eldridge, *supra* note 208 ("Tools are only as good as the person using them, and in order to use these tools properly [requires] spending an enormous amount of time learning and updating themselves on how to use these new tools. Despite what many people outside of the music industry believe, digital technologies have not dramatically reduced the time, or the skill needed to create something great. Anyone can now create something ok, or acceptable, but most of the time, it still requires many years in order to develop the skills required to make something great.").

[211] Popularized by Malcolm Gladwell, the "ten-years-to-mastery" rule has been validated by social science research examining the pathway to success across a wide array of endeavors ranging from sports to science to creative arts. *See* Pager & Aujla, *supra* note 22, at 1121–22. It should be noted, however, that while experience is often a necessary precondition, it does not guarantee success. Raw talent, supportive coaching, and aptitude for learning all play crucial roles as well. *See id.* at 1122–23.

[212] An interviewee noted a successful producer colleague who has minimal computer or technical skill but is a master at hearing a recording and song's deficiencies. *See* Interview with Larry Crane, *supra* note 209 (discussing producer Luther Russell).

DIY artists can purchase the necessary tools and watch any number of "how to" videos online, but that does not guarantee that their home-recorded productions will succeed any more than a home chef who buys a fancy six-burner stove, a set of Le Creuset pots and pans, and a library of cookbooks can expect to turn out Michelin-star worthy cuisine.[213] Rather, succeeding requires talent, determination, experimentation—and typically years of experience.[214]

Furthermore, DIY recordings are fraught with pitfalls for the unwary. One experienced producer/engineer who works frequently with DIY artists tells us that he uses a standard form to offer feedback at the workshops he runs. His form lists twenty common "rookie mistakes" that frequently engender subpar results and invariably appear in DIY recordings. He described the musicians attending his workshop as "heavily invested in the home recording process"—not total neophytes. Even so, every one of their demo tapes exhibits at least *one* of the errors on his form, and most have multiple flaws.[215] Other interviewees echoed this perspective, describing flaws in DIY recordings as pervasive.[216] One Grammy-

[213] Recording professionals see cooking and mixing as closely analogous. *See, e.g.*, Lij Shaw, *Recording Studio Rock Stars Podcast*, (Spotify, Aug. 9, 2023), https://open.spotify.com/episode/5YHTHtOFmO0Vb8Upiu2TVx [https://perma.cc/SFG3-VDCD] (interviewing veteran mix engineer Kevin Paul, who observes: "I do a lot of cooking analogies when I'm teaching [mixing techniques], and I think cooking and mixing are incredibly similar .... Some people are not very good at cooking; some people are absolutely brilliant. They can go straight into the kitchen, look at six ingredients, and make you a meal where you go, 'Wow this tastes amazing!' Where some people go and look at those same six ingredients and it tastes like a dog's dinner. And the reality is, the good news is, you can learn how to go from the dog's dinner to something that tastes amazing, but that takes a lot of practice and a lot of time and a lot of commitment.").

[214] Jason Wyman, the production mastermind behind the band TV Girl's multiple hit records underscores the importance of professional experience: "One thing they told me in [recording] school—that I was just too young to understand and didn't want to believe—was that it takes time .... We all know what a good mix sounds like, but being able to make one takes years and I still don't feel like I can do it. It's just this process that is simply trial by error. Just give yourself time, make a lot of music and try to get your hands on everybody's friend's projects and just mix and make bad music until you make good music." *See Interview with TV Girl*, Synth History (Aug. 19, 2023) https://www.synthhistory.com/post/interview-with-tv-girl [https://perma.cc/T9M4-H4MP].

[215] Interview with Larry Crane, *supra* note 209.

[216] Examples of common mistakes included failing to control ambient noise or treat the recording space to dampen echoes, failure to synch the phasing of different tracks properly, poor microphone placement, errors in software settings, messing up compression or EQ, inappropriate or excessive use of effects, and so on. *See* Zoom Interview with Matt Hennessy, Producer, Recording Engineer, Mix Engineer, and Owner of VSOP Studios (Dec. 3, 2021) (on file with author); Zoom Interview with Maria Elisa Ayerbe, Latin Grammy-winning Mix Engineer, Recording Engineer, and Producer (Dec. 8, 2021) (on file with author); Zoom Interview with Paul "Willie Green" Womack, Producer, Recording Engineer, Mix Engineer, and Owner

winning professional told us that she screens newbie artists to avoid taking on error-plagued projects that turn into nightmares.[217]

B. The Enduring Need for Recording Professionals

As discussed above, the overnight success of "Rich Men North of Richmond" seemed to augur a future of digital democratization. Yet, even setting aside doubts as to the track's DIY provenance, the limited acoustic demands of "Rich Men," recorded with a single microphone capturing a one-take acoustic guitar and vocal performance, hardly generalize to a formula for DIY emancipation.[218] After all, if there is one thing a bedroom producer with a modicum of knowledge can competently record and mix, it is a one-microphone recording.

The reality of modern music, however, is that recordings like "Rich Men North of Richmond" are extreme outliers in terms of their simplicity. The vast majority of recordings in almost every genre—pop, hip hop, rock, jazz, electronic, R&B, country, Latin, and many more—are exponentially more complex than "Rich Men North of Richmond." Most contain dozens of tracks—individually recorded vocals, instruments, and sound effects—all fighting for the same sonic real estate in a pair of speakers or earbuds, and all in need of an experienced ear and technical wizardry to bring them sonic and artistic cohesion.

Therefore, despite the astronomical increase in DIY recordists, professionals with expertise in production, mixing, mastering, and other recording processes remain relevant and often indispensable to the creation of high-quality master recordings. There is a simple reason why record companies, independent artists, and even hobbyists still regularly use recording professionals: for most types of music, it is hard to produce commercially competitive master recordings. That is, few non-professionals can create a finished master that clearly separates vocals, instruments, and other elements in the mix in a way that grabs the listener's attention and leaves a favorable lasting impression. Moreover, delegating discrete tasks to multiple, dedicated specialists enhances the end results. As we found in

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of The Greenhouse Studio (Jan. 20, 2022) (on file with author); Interview with Larry Crane, *supra* note 209; Interview with Mikael "Count" Eldridge, *supra* note 208; Zoom Interview with Ariel Borujow, Grammy-winning Mix Engineer (March 22, 2022) (on file with author).

[217] Interview with Maria Elisa Ayerbe, *supra* note 216.

[218] *See* RADIOWV, *supra* note 6 (live video showing performance into single microphone, from which recording was made).

our empirical data, not only do professionally recorded tracks dominate the charts, but they typically involve an average of 5.5 recording professionals (excluding the artist) in the recording process.[219]

Although professional recording software tools are now within the financial reach of any computer user,[220] our interviewees were uniformly pessimistic about the ability of purely DIY recordings to succeed on a large scale. The tools—as several of our interviewees observed—do not make the artist.[221] Or, as one Grammy-winning mixing engineer put it, "[i]t's never about the gear; it's always about the ear."[222]

Thus, a consistent, recurrent theme in our interviews was that having relevant artistic and technical experience is the most important factor in creating high-quality, professionally competitive master recordings. As acclaimed metal producer and mix engineer Jens Bogren has observed, "The most important thing when mixing [a recording]: It's not the tools. It's not the speakers either, or the [control] room [acoustics]. It's the level of experience the brain has to hear things, and to hear what needs to be done."[223] This experience is typically gained from working on many recordings with many artists. Inexperienced recordists invariably lack the skills necessary to create professionally competitive master recordings.

All our interviewees have worked on many DIY recordings created by artists who tracked in home studios. Some of our producer and engineer interviewees

[219] *See supra* note 95 and accompanying text.

[220] Many fully featured professional digital audio workstation (DAW) programs can be purchased for under $200. At the time of this writing, for example, Apple's Logic Pro X software sells for $199, Image Line Software's FL Studio for $179, Steinberg's Cubase for $198, Cockos' Reaper for $60. Apple's GarageBand app, not fully featured but capable of professional recordings, is available for free to any owner of an Apple laptop or iOS device. All these programs are sufficiently outfitted for producing professional recordings without any additional software, although most serious recordists also have a library of third-party party software "plugins" to augment their DAW software's stock capabilities, adding audio effects or software instruments. *See generally* Mike Senior, Mixing Secrets for the Small Studio (2011) (describing throughout the use of a huge variety of third-party plugins in the mixing and production process).

[221] *See, e.g.*, Interview with Larry Crane, *supra* note 209 (comments by producer/mix engineer Larry Crane that "the tools [do] not equal art.").

[222] Interview with Maria Elisa Ayerbe, *supra* note 216.

[223] Interview by Eyal Levi with Jens Bogren, *Unstoppable Recording Machine Podcast*, at 43:55 (Spotify, June 13, 2018), https://open.spotify.com/episode/71hMIckHn3GaajEst5RUp9 [https://perma.cc/GJ6N-U46Y].

work primarily with independent artists that do basic tracking themselves.[224] Other interviewees reported a more diverse mix of label and independent artist clientele.[225] Regardless, our interviewees estimated that at best a small percentage of inexperienced DIY recordists—around five percent—could shepherd a high-quality recording project from start to finish without professional help.[226]

These accounts are consistent with the quantitative chart data already discussed showing that DIY artists, in fact, are *not* succeeding at the highest levels commercially.[227] Indeed, our qualitative findings provide a more granular and nuanced explanation for those quantitative results. Moreover, our interviewees work with artists at all levels—not merely superstars operating at the high end. Many of their clients cannot afford lavish productions and have tried to go the DIY route. These artists seek professional help because they recognize that the quality of their home recording efforts does not measure up.

That DIY artists struggle is unsurprising to those who understand the technical complexities inherent in the recording process. The natural world is three-dimensional, with sonic information arriving at our ears from 360 degrees around us. Recording engineers, however, are limited to a two-dimensional stereo format.[228] Their challenge is to create within these technical limitations a listening experience that is as captivating and enveloping as a live performance—even more so.

[224] Matt Hennessy estimated that 60% of his recording projects are with DIY artists who seek out his production and mixing services after doing the basic tracking themselves. Interview with Matt Hennessy, *supra* note 216. Willie Green Womack estimated 70% of the projects he mixes are artist-recorded. Interview with Paul "Willie Green" Womack, *supra* note 216. Larry Crane estimated that 75% of his mixing work is "coming from people who are not making their living at music." Interview with Larry Crane, *supra* note 209.

[225] Interview with Maria Elisa Ayerbe, *supra* note 216; Interview with Ariel Borujow, *supra* note 216; Interview with Mikael "Count" Eldridge, *supra* note 208.

[226] *See infra* note 237 and accompanying text.

[227] *See supra* Part II-A.

[228] *See* Alan Parsons & Julian Colbeck, Alan Parsons' Art & Science of Sound Recording: The Book 258–60 (2014). Stereo remains the standard for music mixing but there are, to be sure, emerging spatial audio formats that free audio engineers from the constraints of stereo audio and enables mixing in a three-dimensional sonic domain. Mixing in spatial audio formats such as Dolby Atmos, however, is even more technically complex than mixing in stereo. As we discuss below, therefore, the emergence of these formats only underscores our main point that recording professionals remain crucial to the success of most recordings. *See infra* notes 375–380 and accompanying text.

Thus, creating a finished recording is a process of fooling and exciting the brain's aural sensory processing, and involves far more than plugging in a few microphones and hitting record. Consider a typical recording process for a band: The vocal microphone is placed inches from the singer's mouth.[229] A complex array of six to eight microphones is placed around the drum set, each microphone usually inches from a drumhead.[230] Electric guitar and bass amplifiers are played at high volume with mics placed immediately in front of the loudspeakers.[231] The raw recorded signals individually sound nothing like what a listener in the room would hear with their ears: no one listens with an ear inches away from the singer's mouth, the snare drum, or amplifiers.[232] And the recorded tracks are often intentionally recorded "dry"—devoid of ambient acoustics and room reverberation—to give recording engineers maximum flexibility to add effects and creatively process the tracks later.[233] In other words, most raw recorded tracks sound nothing like listeners' perceptions of live music.

Recording professionals are skilled at taking these raw, isolated sounds and integrating them cohesively through a technological process called "mixing." Moreover, in modern music the finished mix is not usually meant to be a faithful recreation of a live performance. Modern mixes create a soundscape in which the raw tracks have been processed and sculpted to boost pleasant frequencies and remove unpleasant ones, artificially add ambiance, harmonic distortion, and other effects that make the finished master sound exciting, powerful, intimate, or whatever the producer envisions. In other words, recording professionals make the finished master a stimulating artistic statement in which all the sonic elements have a presence and clarity exceeding what one would normally hear standing in the middle of a room of live performers.

Experienced recording engineers employ specialized sonic enhancement and spatial composition skills to make finished recordings particularly attractive:

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[229] Matt Houghton, *Recording Vocals: Vocal Tracking Tips*, Sound On Sound (Apr. 2022), https://www.soundonsound.com/techniques/recording-vocals [https://perma.cc/Q5C5-VPRD] (recommending placing the vocalist between four to twelve inches from the microphone).

[230] *See* Parsons & Colbeck, *supra* note 228, at 191–95.

[231] *Id.* at 215–17, 224–32 (discussing electric bass and electric guitar recording techniques).

[232] *Cf. id.* at 24–27 (discussing the process of isolating musical components in the recording process and noting that recorded instruments sound considerably different from how they sound live in the room).

[233] *See* Houghton, *supra* note 229.

> Recording engineers and musicians have learned to create special effects that tickle our brains by exploiting neural circuits that evolved to discern important features of our auditory environment. These special effects are similar in principle to 3-D art, motion pictures, or visual illusions, none of which have been around long enough for our brains to have evolved special mechanisms to perceive them; rather, they leverage perceptual systems that are in place to accomplish other things. Because they use these neural circuits in novel ways, we find them especially interesting. The same is true of the way that modern recordings are made .... Recording engineers create ... "hyperrealities," the recorded equivalent of the cinematographer's trick of mounting a camera on the bumper of a speeding car. We experience sensory impressions that we never actually have in the real world.[234]

The challenge for audio engineers is to create sonic hyperrealities that appeal to rather than repulse listeners. When creators' attempts to leverage the brain's perceptual systems miss the mark, the result is off-putting—akin to poorly rendered 3D conversions of 2D films or to the "uncanny valley" effect that marred early CGI efforts.[235] The same principles apply to audio. Clumsily processed audio—poorly tuned vocals that grate on listeners' ears, muddy or tinny sound that dulls a song's emotional impact, or overcompressed, "squashed" mixes—mar the esthetic experience even for casual listeners using cheap earphones. It typically takes years of experience and experimentation to successfully create hyperrealistic recordings that listeners find engaging and exciting rather than insipid or grating.[236]

Thus, our interviewees agreed that only a small minority of DIY artists can shepherd a home recording project entirely on their own from the start to finish.

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[234] Daniel J. Levitin, This Is Your Brain on Music: The Science of a Human Obsession 105–06 (Daniel J. Levitin 2006).

[235] *See* Meghan Neal, *Why Are 3D Movies Still a Thing?*, Vice (May 12, 2016, at 06:00 ET), https://www.vice.com/en/article/8q8xy3/why-are-3d-movies-still-a-thing [https://perma.cc/AHS7-VXS2]; Eleanor Burnard & Robert Lee III, *The 10 Worst Cases of the Uncanny Valley in Film*, Collider (Jan. 2, 2024), https://collider.com/worst-cases-of-uncanny-valley-movies/ [https://perma.cc/VT64-54YX].

[236] As Count put it, "The Malcolm Gladwell rule [that it takes 10,000 hours to master a skill] really does apply" to the recording process. "You may get those 10,000 hours in in six years if you're obsessed. But very few people are going to get great at it in less than that." Interview with Mikael "Count" Eldridge, *supra* note 208; *see also* Interview with Maria Elisa Ayerbe, *supra* note 216; Interview with Matt Hennessy, *supra* note 216; Interview with Larry Crane, *supra* note 209.

Their estimates ranged from 20% to less than 1%, with most estimating that just around 5% of DIY artists can record a professionally competitive production from start to finish.[237] Our interviewees also agreed that virtually no one starting off should expect to succeed without at least some external assistance.

Skeptics might wonder what "success" means in this context. We pressed our interviewees on this point, questioning whether they were fetishizing acoustic subtleties that only a professional or hard-core audiophile listening on high-end equipment would detect. They demurred, emphasizing that acoustically flawed recordings significantly detract from the listener's experience no matters what kind of speakers you use. Moreover, several were emphatic that recording quality directly impacts the artist's bottom line, as subpar recordings are highly unlikely to attract an audience in today's hypercompetitive market:

> There's more music being created and released every day than there ever was in an entire year in the past. And because of that, it fuels competition. And with competition, people are going to prefer the thing that sounds a little better, even if they don't necessarily notice or are able to articulate that, they will gravitate towards something that sounds better.[238]

DIY artists who try to mix their own recordings tend to have, as another interviewee observed, "a huge problem" because "you're competing against [the]

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[237] Ayerbe estimated less than 1% of DIY artists could make a commercially competitive recording with zero professional help. Interview with Maria Elisa Ayerbe, *supra* note 216. Hennessy similarly put his estimate at "probably one to two" percent. Interview with Matt Hennessy, *supra* note 216. Ariel Borujow estimated about 10% but noted that it depends on the style of music—higher than 10% for hip hop and electronic (although electronic musicians tend to get it professionally mastered if they do it themselves), and less for genres involving live instruments, such as rock. Interview with Ariel Borujow, *supra* note 216. Hopeless Records executive Christina Johns, when asked how many artists on Hopeless' roster are purely DIY, said, "I would say, none of them." Interview with Christina Johns, *supra* note 202. Patrick Amory, president of independent label Matador Records, told us that his label currently has one artist who handles all the recording and production roles themselves (except for mastering), and that on "a roster of about 20 to 23 active artists at any given time .... I would say that, over the years, one [DIY artist out of 20 to 23] is probably about the right percentage." Zoom Interview with Patrick Amory, President & Co-Owner, Matador Records (Oct. 18, 2023) (on file with author). Warner Music Nashville executive Ben Kline said, "We're talking about less than 10%. Closer to 5%." Zoom Interview with Ben Kline, Executive Vice President and General Manager, Warner Music Nashville (Sept. 22, 2021) (on file with author); Willie Green Womack said, "[I]t's somewhere probably in that 10 to 20% range of people who just innately have those skills to compete with those level of records," but if "it's your first time I would put it around that 10%. But [you'd] better have some great songs." Interview with Paul "Willie Green" Womack, *supra* note 216.

[238] Interview with Mikael "Count" Eldridge, *supra* note 208.

sound [of professional engineers who work on chart-topping recordings]. So, [even] if your song is great, nobody's gonna give a shit if it doesn't sound like [the top hits]."[239] This is especially true given that taste-making gatekeepers such as popular playlist curators and social media influencers remain extremely important to the promotion and discovery of new music:

> People within the industry—which is, unfortunately, still a big part of who gets heard and who gets known and discovered as an artist—tend to have the first listen to these artists. And people who listen to music all day, every day are like, "Yeah, doesn't sound that great." [Or,] "Oh, this one sounds good. Check this out—I'll put this on my playlist on Spotify, or I'll send this to my friend, or I'll talk about them on my blog or on Facebook." .... [T]hat is a real thing.[240]

Another interviewee concurs: "[I]f people are putting the songs on a playlist, my records are out there being compared to Drake or being compared to Beyonce, or Jay Z .... So, ... high quality mixes are going to stand out more because they might be in the same playlist back-to-back with [hits by superstars]."[241]

A handful of DIY artists might overcome such handicaps with an outstanding song or through sheer musical talent that outshines their recording flaws. However, they are fighting with one hand behind their back and selling short their music's potential. Accordingly, one of our producer/engineer interviewees who works primarily with rock artists estimates that seventy-five percent of the home recordings he works on have serious technical and sonic problems that undermine the finished product. "[H]onestly, with a lot of ... home-recorded or self-recorded things that people are sending me, 75% of it is more of a rescue job than a fine-tuning job." [242] Because in his experience poor home recordings are the norm, he

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[239] Interview with Ariel Borujow, *supra* note 216; *see also* Interview with Christina Johns, *supra* note 202 ("We are competing with major [labels] and so you can't really do that if their stuff sounds amazing and your stuff sounds like crap.").

[240] Interview with Mikael "Count" Eldridge, *supra* note 208.

[241] Interview with Paul "Willie Green" Womack, *supra* note 216; *see also* Interview with Christina Johns, *supra* note 202 ("[Our label is] pitching [our artists' songs] for playlists, and sometimes radio, and sometimes sync [licensing] and movies and stuff, and I feel like if it doesn't sound like a high quality recording, you're not going to get any of those things.").

[242] Interview with Larry Crane, *supra* note 209. Other interviewees echoed this viewpoint.

cautions against generalizing the likelihood of success for subpar recordings based on isolated success stories:[243]

> Is there something that's being done [musically in some recordings] that's so unique that it's going to translate no matter how it was recorded … ? Absolutely true, because there are very unique artists like Tune-Yards, or whoever else. But to say that the technology has come far enough that you don't need a recording studio at all, and to get results of a certain high caliber, say, like the quality of a Pink Floyd record or Steely Dan …. I mean, that's a joke, because the tracks I get sent from home recordists— … half the time someone's trying to record a drum kit, it sounds awful, just flat out awful. And all I'm doing is trying to mitigate that in the mixing process.[244]

Achieving a high-quality master recording is also important to a song's artistic success.[245] As one of our mix engineer interviewees put it, when artists hire him to mix their song, they are demonstrating "that they care about their art [and] that they want to compete with the top people out there."[246] Another interviewee, a major record label executive, remarked that hiring top recording professionals to work with his artists is important not to "appease audiophiles," but rather because surrounding the artist with top-flight talent can inspire the artist to "capture exactly the emotion and message that [the artist] set out to in the best way possible."[247] He continues, "[T]he experience of the recording can be heard in the final product. If [the artist] is around world class musicians and producers, the best performances come when high tide is lifting all boats."[248]

1. Professional Roles in the Recording Process

As we noted above, accounts of digital recording in the IP literature typically gloss over the complexities of the recording process. They focus primarily on

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[243] *Cf.* Spencer Tweedy et al., Mirror Sound: The People and Processes Behind Self-Recorded Music (Prestel, 2020).

[244] Interview with Larry Crane, *supra* note 209.

[245] *See* Levitin, *supra* note 234, at 15 (noting the artistic importance of the sound as well as the songs on a recording, and quoting legendary singer-songwriter Paul Simon as saying, "The way that I listen to my own records is for the sound of them; not the chords or the lyrics—my first impression is of the overall sound.").

[246] Interview with Ariel Borujow, *supra* note 216.

[247] Interview with Ben Kline, *supra* note 237.

[248] *Id.*

one aspect of the recording process—capturing sounds—and gloss over the other critical aspects of the production process.[249] But as one of our interviewees observes, "Capturing and *presenting* is what we do with most art forms. And to think that just the capturing matters is usually wrong."[250] The stages in which the "presentation" of the recording are achieved—the production, mixing and mastering stages—are usually more complex and often more important than the technical capturing of sounds. Our interviewee refers to it as the difference between recording and "making a record": "Those are two different things. Recording [is] just capturing something . . . . *Making a record* is a conscientious decision to present something to the world at the utmost of what it could be at that point, using any technique . . . to get there."[251]

The key steps involved in this process of capturing sounds and presenting them—i.e., "making a record"—are recording, production, editing, mixing, and mastering. These steps are sufficiently complex that in professional recording processes the roles of recording engineer, producer, editor, mix engineer, and mastering engineer are often (though not always) divided among different individuals. Below, we describe each of these roles and stages in the recording process and highlight the continuing value of professionals at each stage.

1.1. *Recording Engineers*

Even the "capturing" phase of recording involves more than just pressing "record." You have to decide how many microphones you need, what kind, and where to place them. You need to adjust sound levels, minimize ambient noise, and control for acoustic reverberations. Recording engineers need a solid understanding of sound's physical properties and the technical know-how to operate their recording equipment in the desired manner. Recording engineers work closely with the artist and producer (discussed in detail below) to capture the performances on tape or computer hard drives. Each musical element (a voice, a piano, an individual drum in a drum set) is typically isolated and recorded onto a separate audio track.[252]

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[249] *See supra* note 203 and accompanying text (discussing how copy-skeptic arguments about digital democratization of recording focus almost exclusively on the cost of recording equipment and software).

[250] Interview with Larry Crane, *supra* note 209.

[251] *Id.*

[252] *See* Parsons & Colbeck, *supra* note 228, at 223–25.

Recording is the stage most amenable to DIY production today. Three decades ago, even recording a simple guitar-and-vocals track required renting time in a professional studio at several hundred dollars per hour. Because analog studio setups were complex, recording engineers were necessary for even the most basic tasks. Today, our interviewees largely agreed that most inexperienced home recordists can get a "serviceable" vocal recording with an adequate microphone plugged into an inexpensive computer audio interface by applying some basic, common-sense recording techniques.[253]

However, the more live instruments—drums, piano, acoustic bass, amplified electric instruments, strings, and so on—are involved in the recording, the more complex the process and the more likely an experienced recording engineer is needed to achieve a professional sound.[254] Thus, genres that do not generally rely on recording live instruments, such as hip hop and electronic music, are more conducive to achieving high quality results through basic home recording. Genres such as jazz, rock, country, classical music, and so on, which typically involve recording multiple instruments with complex miking techniques, usually need engineering expertise to obtain professional results.[255]

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[253] Interview with Paul "Willie Green" Womack, *supra* note 216 ("[I]t's entirely possible, if you have a quiet room and a decent mic, and interfaces are more affordable than ever. You can absolutely get a good quality take .... 60% of people can get a totally serviceable vocal .... [I]f you want to just record a rap over a beat, send me the files to mix. [The tracking] part of it isn't heavy lifting. I would say ... keep it simple. Don't try to do a lot of effects. Don't try to do too much. Get a nice sound level into your mic, into your interface, in a quiet room without a lot of stuff going on. And then we can make a record. That's no problem."). Maria Elisa Ayerbe, however, thought fewer than half of home recordists could achieve a usable sound recording basic tracks on their own. Interview with Maria Elisa Ayerba, *supra* note 216 (estimating that about half of the DIY recordings submitted to her for mixing are workable, but of those, between 15%–20% need some parts to be re-recorded).

[254] *See, e.g*, Interview with Paul "Willie Green" Womack, *supra* note 216 ("Recording a vocal is much simpler than recording a drum kit with six microphones on it, and you're worrying about phase, mic placement in different ways, this and that; there's a lot more that goes into that."). Jazz or classical music are even more challenging to record well. *See* Interview with Matt Hennessy, *supra* note 216 ("Jazz would be really hard [to record DIY] ... because that's so much about pristine recording and live instruments in a space. Classical would be extremely difficult because that's [recorded in a hall] and what renders a classical recording unusable is like a hair: [if] the stereo image is shifted 1% to the left, this recording is unusable.").

[255] *See, e.g.*, Interview with Ben Kline, *supra* note 237 ("Someone could play me something today that they did at home by themselves, and it might be better than anything I've heard in a year. I'm not denying that could exist. I would consider that to be the exception rather than the rule—certainly in [country music]. You know, hip hop, which is a very beat-centric genre, is probably another model completely. And when ... there's not as much reliance on live instrumentation, certainly, that's a different conversation.").

1.2. *Producers*

In general, the producer functions like a director on the set of a movie or theatrical production. They supply a creative vision for the final recording and oversee and coordinate the processes to execute that vision.[256] Legendary producer George Martin, for example, helped the Beatles flesh out ideas and improve their recordings by listening critically and then suggesting compositional enhancements, instrumental arrangements, and an overarching vision for the recording's character and atmosphere.[257] He helped execute that vision by composing and conducting arrangements for orchestra and other instruments, and by experimenting with recording technologies to achieve desired sounds.[258]

Several interviewees stated that the availability of inexpensive recording tools has not replaced the important role of producer.[259] For many artists, there is still significant value in having an experienced hand working closely with the artist to listen critically, suggest musical ideas and directions, refine lyrics or arrangements, and provide an alternative source of artistic vision and inspiration.[260] According to one interviewee, 90 percent of the musicians he works with lack the experience

[256] The producer may have absolute creative control or alternatively might be hired in a supporting role to help guide the artist in finding her creative vision. This may involve working with the artist or songwriter to change the underlying composition, acting as a sounding board for the artist for musical ideas, adding new musical arrangements to the composition, coordinating session musicians, coaching the artists' and other musicians' performances, making the ultimate decision about which takes of a given performance are final, and overseeing the mixing and mastering processes to ensure the ultimate sound of the recording, audio effects used, and so on, match the producer's vision. The producer may be the artist herself, but it often is someone other than the artist who can provide a different range of experience and creative ideas.

[257] *See* Allan Kozinn, *George Martin and the Beatles: A Producer's Impact, in Five Songs*, N.Y. Times (Mar. 9, 2016), https://www.nytimes.com/2016/03/10/arts/music/george-martin-and-the-beatles-a-producers-impact-in-five-songs.html [https://perma.cc/GWK8-3XY9]. Martin's contributions were so substantial that he is often referred to as "the fifth Beatle." *Id.*

[258] *Id.*

[259] Interview with Mikael "Count" Eldridge, *supra* note 208 ("[M]ost people outside of the music industry think, 'Oh, you go to a professional recording studio, and the main purpose of that is having expensive microphones and record yourself.' Well, that part of the process is actually the part where technology has helped artists create more affordably. And it's not the most difficult part of the process .... I may not get involved [in a recording as a producer] until [the artist has] already done all the writing, they've tried demoing it, they've even tried doing final recordings themselves. They've gotten it as good as they can. And then they're like, 'Man, this does just not sound as good as Radiohead's album. I don't understand. I bought the $5,000 microphone. Why doesn't it sound as good?' ").

[260] *Id.* ("[F]or the most part, most artists, even experienced producers, really need outside help during [the writing and arranging] phase.").

to "know when something isn't right" with their song, sound, or arrangement.[261] In addition to lacking production expertise, artists often benefit from the division of labor, outsourcing production and engineering to professionals with more experience in those areas:

> "[M]ost bands simply don't have the expertise to [produce themselves], or the experience, or even want to .... It's not their thing. They're the songwriters, and maybe good performers at their instruments. And they've spent ten or fifteen years getting great at that. And now all of a sudden they're being asked to ... become an expert in this technical part, as well."[262]

Expecting DIY musicians to master the complexities of home recording along with all the other tasks that digital disintermediation imposes means they have less time to focus on songwriting and musicianship.[263] Artists whose heads are distracted by the technical details of recording may not deliver their best performances.

Producers allow artists the luxury of delegating these chores, enabling them to focus on their music. Producers also play an important role—again, analogous to directors—in coaxing transcendent performances. Making artists comfortable in the studio space, helping them to "get into the vibe," and providing encouragement and constructive feedback are all part of the job.[264]

1.3. *Editors*

Editing has long been a part of the professional recording process. One can, for example, hear splice points in the Beatles' "Strawberry Fields" where two takes were edited together by splicing tapes.[265] Editing audio, like editing film, is highly

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[261] Interview with Larry Crane, *supra* note 209.

[262] Interview with Mikael "Count" Eldridge, *supra* note 208.

[263] Count elaborates, "Increasingly, artists are releasing songs that are never touched by any outside producer, mixer, or mastering engineer. Although this is empowering, few artists truly have the resources, time, and desire to learn all phases of music production, and few artists/performers are even capable of becoming experts in all of these tasks. There are countless examples of musical greats from the past who may have been excellent singers, performers, or talented at their one instrument, but would never have been capable of *also* being good at arranging, recording, editing, mixing, and mastering." *See id.*

[264] *Id.*; *see also supra* note 247 and accompanying text (discussing the role of the producer in helping to bring out the artist's best performances).

[265] *See* Kozinn, *supra* note 257.

technical and requires significant experience to be done well. This is true even in digital audio, where poor editing can be obvious and ruin a recording.

Digital recording software makes precise editing of performances much faster and more convenient than editing on analog master tapes. However, the ability to edit out blemishes has raised audience expectations. Modern recordings are usually heavily edited to remove unwanted ambience or other sounds, pitch-correct out-of-tune notes, and time-correct out-of-time performances.[266] Professional editors are therefore more in demand than ever.

Indeed, the prevalence of home-recording has only increased the demand for their services. Flawed DIY tracks often require extensive post-production fixes and arrive in a jumble of redundant takes that need to be painstakingly sorted and assembled. One producer bemoaned the over-reliance on editing, calling his job "exponentially more difficult" because for each project he spends an entire day "sorting through takes" and "editing performances that aren't that great."[267] Another interviewee told us he now spends more time editing vocal tracks than recording them.[268]

1.4. *Mix Engineers*

Once a song has been arranged, produced, recorded, and edited, mix engineers specialize in blending the raw, individually recorded audio tracks (isolated instruments, voices, and other sonic elements) together with audio enhancements and effects to create a cohesive, attractive, and artistic sonic presentation, usually in stereo.[269] Mixing is such a specialized and often technically complex process that several of our interviewees identified mixing as the stage where the absence of

[266] Interview with Paul "Willie Green" Womack, *supra* note 216 ("[Pop and R&B vocal] editing is going to take significantly longer [than hip hop vocal editing] because … I'm old school. I still go through syllable by syllable and hand tune vocals. I'm not a big fan of just slapping the autotune plugin on there. You can do it, and you can get that 'auto-tune sound.' But if I'm trying to tune a vocal where you can't hear it's been tuned, then I'm doing it by hand. And so that's going to add some time to it.").

[267] Interview with Mikael "Count" Eldridge, *supra* note 208.

[268] Interview with Matt Hennessy, *supra* note 216 ("Technology has changed that in the fact that [now] you could just sing [the vocal track] four times, and then I can spend four hours tuning it. But the difference there is that … [in] the old days, you would sing for five hours, and then I would go home, because the job would be done. Right? So, it's more of a transfer of time, as opposed to less time. The artist sees it as less time because *they* did less work. But no less work actually happened.").

[269] A stereo recording is one in which all the sounds emit from two channels; thus, mixing forty-eight individual recorded tracks, for example, would require blending all of those tracks plus added sonic elements

professional help would be most obvious to listeners.[270] It is also a highly creative process, where inspired touches can elevate a good track into a great one.[271]

Mixing includes balancing the volume levels between sonic elements and "panning" them by placing the sound at a chosen point in the stereo field (e.g. right, left, or center).[272] Mixing involves far more than level-balancing and panning, however. The mix engineer must fit together the elements in a production like a complex sonic jigsaw puzzle in which every piece has a distinct space and character but all are seamlessly melded into a cohesive sonic whole.[273] Mixing

such as reverb to two tracks. Today, as discussed in detail below, multichannel formats are on the rise, such as Dolby Atmos.

[270] Even DIY artists who intentionally aim to achieve a "lo-fi" sound, our interviewees said, cannot cut corners, noting that lo-fi is a stylistic approach, not a question of recording quality. There are "good" and "bad" sounding lo-fi recordings and creating the former still requires experience and expertise to make sonic elements distinct, keep bass frequencies controlled, and so on. *See* Interview with Mikael "Count" Eldridge, *supra* note 208 ("You might want it to sound worse, but on purpose. You want it to sound lo-fi. But is it lo-fi in a cool way? Or does it just sound bad? . . . What's important is not whether it's technically good, but whether it sounds the way you intended and want it to sound. Does it sound the best it could be, even if your intent is lo-fi? . . . Is it the most in your face and distorted and coolest shit? . . . That usually requires somebody who has a lot of experience and knows what they're doing.").

[271] *See, e.g.*, *id.* ("At the very least, you're going to want to get a mixer. In this process, even if you're totally DIY and you've done every other part of the process yourself, if you don't have a good mixer mixing it, that's when not only you, but even the average casual listener, can hear that difference. They may not be able to hear the DIY self-recorded part. They may not be able to hear the fact that [the artist] did a rough recording and it actually sounds pretty good. But they will definitely hear the difference between something that was mixed by an artist versus somebody who has something that was mixed by a professional. And typically, they don't really know how to articulate it. The average person will just say, 'Oh, that sounds really good quality or really well produced.' . . . [What] they're hearing is not in the recording; it's actually in the mixing.").

[272] *See* Senior, *supra* note 220, at 118–40. Level balancing between sonic elements is a core aspect of the mixing process: how loud should the guitar be perceived in relation to the lead vocals and other instruments, for example, and how loudly should the guitar and vocals together be perceived in relation to other elements such as the drums? Level balancing ensures every element is audible and at a desired loudness level, which helps determine that element's sonic impact. Level balancing a multitrack project can be an incredibly complex process, as increasing the level of one instrument or voice changes the perceived loudness and clarity of others, making them sound quieter or "buried." *Id.* Experienced mix engineers develop techniques to level balance effectively and "gain stage"—that is, ensure levels are properly set at every stage of audio processing to minimize unwanted noise while avoiding distortion. *See, e.g.*, *id.*; Nick Messitte, *Gain Staging: What It Is and How to Do It*, Izotope (July 24, 2025), https://www.izotope.com/en/learn/gain-staging-what-it-is-and-how-to-do-it.html [https://perma.cc/Z9G7-QX9C].

[273] For example, instruments in a production often contain redundant frequencies: a hip hop song may have sampled drum and effects loops, synthesizers, bass, and vocals that all have significant sonic energy in the same low-frequency range. Combining those tracks will multiply that redundant low-frequency energy, resulting in a muddy, "boomy" sound in which the bass frequencies overpower the music and individual

is both technically complex and highly creative, as the mix engineer's ultimate responsibility is to create an exciting and enveloping listening experience. As noted above, the mix engineers who work on chart-topping recordings are masters at "tickling the brain."[274] They create hyper-realistic soundscapes that can imbue a song with added movement and energy that maximizes its esthetic impact.

Our interviewees were uniformly skeptical about the ability of inexperienced DIY artists to make mixes that could compete with those made by seasoned professionals. Some of our interviewees pointed to a lack of access to high end recording tools as a notable limitation for DIY recordists—especially the lack of a professional monitoring environment when mixing, which can result in muddy, sonically uneven mixes.[275] The most frequently cited obstacle facing DIY mixers, however, was the lack of experience, ear training, and understanding of how to use complex sound-shaping tools of the mix engineer's trade, such as equalization,

elements "mask" one another, making them indistinct. Similarly, in a rock production, electric guitars, synths, lead vocals, and snare drum—all key elements of the production—might all exhibit sonic peaks at similar midrange frequencies, creating harshness and sonic congestion, resulting in an unpleasant, unclear mix. Experienced mix engineers have the expertise to identify problematic frequency areas (which in a complex mix are found throughout the frequency spectrum) and shape individual sounds to create sonic separation, eliminating frequency redundancy and greatly improving clarity and listenability. *See, e.g.*, SENIOR, *supra* note 220 at 176–77 (discussing the challenges of mixing instruments that occupy the same frequency range, such as bass guitar and bass drum, and describing solutions used by experienced mix engineers to make conflicting frequencies from disparate sound sources work in a mix). They can also manipulate sonic elements to accentuate them, causing the right sounds to "pop" at the right time to maximize their impact. *See, e.g.*, *id.* at 282–85 (describing how top mix engineers "ride" level faders of vocals, instruments, and even effects such as reverbs to grab listeners' attention at key moments in a track).

[274] *See* LEVITIN, *supra* note 234 and accompanying text.

[275] Interview with Matt Hennessy, *supra* note 216 (providing examples of typical problems that doom DIY recordings and observing that the problems are "almost always monitoring environment-related"); Interview with Maria Elisa Ayerbe, *supra* note 216 ("I always advise my students, if you want to get really good at mixing, you have to build yourself a good room. And that's the room itself. It's going to be $10,000, at least, right? And that is just by default. It's really difficult for any mixing engineer to produce a commercially acceptable, professional mix just with the computer and the monitoring system and ignoring the room."). The "monitoring environment" refers to the acoustical properties of the room in which the mixing or mastering engineer monitors how they manipulate the recording. Professional studio control rooms are typically designed by specialist acousticians to eliminate uncontrolled sound wave reflections and resonances that degrade acoustics and inaccurately color the engineer's perception of the recording. SENIOR, *supra* note 220 at 16–28. Poor monitoring acoustics can deceive engineers' ears, leading to judgements that translate badly to consumer systems and ruin the mix. *See id.* As one expert put it, "You can have the best equipment in the world in your control room, but if the room sounds like shit, you're onto a hiding to nothing." *Id*. at 16 (quoting producer and mix engineer Spike Stent).

dynamic compression, and reverb.[276] Used skillfully, these tools create cohesion and excitement in a mix.[277]

One of our interviewees opined that mixing "is such a specific and separate skill set" that artists and even experienced producers should usually leave it to specialized mix engineers: "Way too often the producer is trying to mix and they screw it up."[278] Indeed, mixing is so specialized that even professional mix engineers tend to subspecialize in discrete musical genres. For example, top mixers in the metal genre are uniquely skilled among their peers at fitting instruments and vocals around an omnipresent "wall" of heavily distorted guitars, which they describe as akin to "trains passing" or "filtered pink noise that is covering everything" else in the mix.[279] Thus, when even A-list pop or rock engineers

[276] *See* Interview with Paul "Willie Green" Womack, *supra* note 216 ("The old adage 'garbage in garbage out' still applies. If you don't properly understand compression, for instance, … to be able to master attack and release times and how much [compression] you're using, [you may end up with a] super over-compressed, very squashed song with no dynamic range …. When you put that on Spotify, it's not going to sound as good as the next song next to it because of the loudness management and all the things that the streaming services do to our song …. So, when I'm mixing, I'm taking these things into account …. [W]hen it translates to that final listener, it just sounds like the song is supposed to sound and algorithms haven't done strange things to it.").

[277] Equalizers (EQs) are frequency-shaping tools—essentially highly sophisticated and precise versions of the treble and bass sliders found on home and car stereos. *See* Parsons & Colbeck, *supra* note 228, at 73. EQs are used to boost desirable frequencies or reduce or carve out undesirable frequencies to create definition, clarity, and desired tonal shaping. *See* Senior, *supra* note 220, at 171–91. Dynamic range compression reduces the dynamic range of an audio signal by automatically reducing the signal's loud parts and increasing the quieter parts. *See* Parsons & Colbeck, *supra* note 228, at 87. This keeps the overall loudness level of the signal more consistent. *Id.* For example, a recorded acoustic guitar will invariably have passages that are louder or quieter than others. Compression brings the louder parts down to be closer in level to the softer parts, resulting in more uniform sonic dynamics. Once the peaks in the recording are decreased through compression, the overall level of the signal can be increased. *See* Senior, *supra* note 220, at 143–63. Artificial reverberation is probably the most widely used sonic enhancement in mixing. *Id.* at 231. Reverb is used to simulate the sonic reflections that arise in real acoustics. *Id.* Adding reverb to tracks recorded in anechoic recording booths reintroduces a natural and pleasing ambience to the sound. Parsons & Colbeck, *supra* note 228, at 108. But reverbs are used equally frequently as a creative tool to make things sound bigger or more impactful or create lush and extraordinary three-dimensional effects and soundscapes of endless variety. Senior, *supra* note 220, at 231.

[278] Interview with Mikael "Count" Eldridge, *supra* note 208. Count continues: "There's a lot of people out there shooting themselves in the foot that are good producers, decent producers, but just from the financial constraints are deciding to mix it themselves as well and that's not a good idea in most cases."

[279] Kohle Audio Kult, *What Makes a METALMIX Great? (feat. Jens Bogren and Warren Huart)* (YouTube, Mar. 4, 2021), https://www.youtube.com/watch?v=ubzGT9vgMqo&t=322s [https://perma.cc/3G6E-ZQDB] (comments by metal mix engineer Kristian Kohle).

attempt to mix metal songs, the results "usually end up pretty disastrous."[280] Similarly, one of our interviewees specializes in mixing Latin music, and reggaeton in particular. She noted there are "big differences" in how Latin music subgenres are mixed, and different mixing conventions are used for salsa music created in Cuba versus Colombia versus New York, and so on.[281]

Digital technologies have, if anything, made the mixing process even less amateur-friendly. There are thousands of software "plugin" modules available for mixing engineers to perform discrete mixing tasks. Plugins often present an array of virtual knobs and buttons that bewilder neophytes, with arcane labels such as "threshold," "attack," "knee," "Q factor," "pre-delay," and so on. This vast array of digital tools enables unlimited sound-sculpting possibilities, so today's mixers must master and stay abreast of more tools than their analog-bound forebears, whose hardware rigs offered limited sound-shaping capabilities by comparison.[282]

Further, the industry is trending toward new spatial audio formats that significantly increase the technical complexity of the mixing process.[283] Spatial audio formats enable mixing in a three-dimensional audio environment, which requires specialized software, bespoke monitoring equipment, and require that even professionals learn a new approach to mixing. Music streaming services including Apple Music, Amazon Music, and Tidal are heavily promoting spatial audio formats such as Dolby Atmos. If Dolby Atmos succeeds as a new standard, professionals will be even more in demand and the gap between DIY and professional productions will grow.

[280] *Id.* (comment by metal mix engineer Jens Bogren, citing example of a famous metal band that hired "high-end rock mixers—the most expensive dudes in the business" to mix an album, and how "it's considered almost to be a joke how that turned out").

[281] *See* Interview with Maria Elisa Ayerbe, *supra* note 216.

[282] *See, e.g.*, Parsons & Colbeck, *supra* note 228, at 109 (quoting engineer Alan Parsons describing the comparatively limited equipment options available to him when he recorded Pink Floyd's *Dark Side of the Moon* at Abbey Road Studios in 1973).

[283] *See, e.g.*, Sweetwater, *Rig Tour: Chris Lord-Alge Shows Us His Incredible Atmos Rig*, (YouTube, July 14, 2022), https://www.youtube.com/watch?v=G99nZYoE3S4 [https://perma.cc/F4WD-ZBM7] (interview with top-flight mix engineer Chris Lord-Alge, who discusses in detail the complexities of mixing in the Dolby Atmos format and remarks that "it's not for the squeamish").

1.5. *Mastering Engineers*

Lastly, mastering engineers put a final sonic "polish" on a mixed recording using tools such as equalization and dynamic range compression to create sonic cohesion between songs on an album which may have been recorded at different times and places by different people.[284] They also enhance the overall sonic quality of the finished recording, ensure mixes sound good on a variety of playback devices from headphones to car stereos to phone speakers, and ensure sound levels meet specifications for streaming services and physical media formats such as vinyl and CD. Mastering is another skillset so specialized that some experienced mix engineers defer to dedicated mastering engineers to handle the mastering process.[285] An independent record label executive we interviewed identified mastering as a critical stage, for which the label hires top professionals.[286] His company pays a premium price to ensure every track on the album is perfectly calibrated and optimized for every major streaming service and all formats, including vinyl.[287] The diversity of formats and media available today accentuates the demand.[288]

[284] The mastering process originated in the heyday of vinyl records. After music was recorded on reel-to-reel tapes, the tapes were sent to a mastering engineer who would cut a lacquer disc from which a mold would be created to serve as a "master" for vinyl record production. *See* Adam Kagan, *Mastering Music: A Century of History*, Sonarworks Blog, (Nov. 2, 2022), https://www.sonarworks.com/blog/learn/the-history-of-mastering [https://perma.cc/85UZ-VS54]. The mastering engineer would process the taped audio using equalization and dynamic compression to optimize it for the relatively limited sonic parameters of vinyl. *Id.* Today's mastering engineers focus on sonically enhancing recordings, providing a final quality control check to ensure files are not distorted or improperly edited, embedding metadata in digital files, and ensuring files are properly encoded for sundry formats including vinyl, TV, film, video games, CDs, and of course the unique specifications of each digital audio streaming service. *Id.*

[285] *See* Interview with Larry Crane, *supra* note 209 ("Technically, yes, I could master something. But it's not a field that I've gone in to research and get good at. And I have so many friends who are amazing at it that are thoroughly affordable in my opinion. What's the point?").

[286] Interview with Patrick Amory, *supra* note 237 ("Very, very few artists want to do the mastering themselves or hand us in something that's already mastered. And we work with all the big mastering houses, the mastering engineers, and the bills have been going through the roof recently, for whatever reason, which is sort of the opposite of maybe what you would expect from this whole process.").

[287] *Id.*

[288] *See* Kagan, *supra* note 284.

2. Will AI Replace Recording Professionals?

"Smart" software tools—touted as powered by AI—are increasingly common for mixing and mastering.[289] These tools analyze individual tracks or entire mixes and then process them with "optimal" equalization, dynamic processing, and reverb settings for mixing or mastering. In theory, even home recordists with rudimentary knowledge could apply these plugins to a mix and automatically achieve professional results.

One of us (Priest) owns and has experimented with AI automated mixing and mastering software from several companies, including Sonible, Izotope, Apple, and Landr. At the time of this writing, AI solutions for *mixing* remain, in Priest's view, far short of the promise of a fully automated mix "engineer" that can deliver results on par with top professionals. AI mixing tools analyze individual tracks and apply "optimal" processing settings for equalization, dynamics, and reverb to individual tracks.[290] However, while AI mixing software can suggest helpful settings for individual tracks, it is presently limited in its ability to fit all those sonic "pieces" together as a finished mix without significant human involvement.[291]

While AI mixing software can, in theory, select technically "correct" settings for individual tracks, that approach, in the view of top mixing engineers, is exactly the wrong way to go about mixing. According to one celebrated mix engineer,

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[289] Two prominent full software suites that purport to be able to perform professional-level mix functions automatically are the Sonible smart:bundle and Izotope's Neutron. AI-based, automated mastering solutions include Landr, emastered, CloudBounce, and many others. *See* Stuart Adams, *We Tested 4 of the Most Popular Online E-mastering Services and Compared Them to a Real Mastering Engineer. Here's What Happened*, MUSICRADAR (Dec. 1, 2023), https://www.musicradar.com/news/online-e-mastering-services [https://perma.cc/BE3U-T6X3].

[290] *See* Stuart Adams, *Can AI Mix Better than a Real Mix Engineer? We Put iZotope's AI-powered Neutron 5 to the Test to Find out*, MUSICRADAR (Dec. 12, 2024), https://www.musicradar.com/music-tech/can-ai-mix-better-than-a-real-mix-engineer-we-put-izotopes-ai-powered-neutron-5-to-the-test-to-find-out [https://perma.cc/ZTV3-7TLS] ("Once the Neutron 5 [AI mixing software] plugin is inserted on a track, the Assistant can be told to listen to a small portion of the track's audio and then configure the processors accordingly. It does this by identifying the instrument that is playing and then setting up the processors in a way that attempts to match that instrument's sound with a supposed ideal.").

[291] Some AI mixing software can balance frequencies across tracks. For example, Sonible's AI mixing suite enables cross-channel processing to minimize interference in the frequency spectrum between up to ten tracks. *See smart:EQ 4*, SONIBLE, https://www.sonible.com/smarteq4/ [https://perma.cc/KQS3-LYYG] (last visited Nov. 15, 2025). Although such "frequency unmasking" tools can be useful time-savers for mix engineers, they presently fall short of being able to deliver a finished mix at the push of a button.

"[a] mixer's job is to make the *song* work, not the *mix* work. The song has to *feel* good."[292] Mixing algorithms are presently a long way from being able to "feel" the emotional effect of a mix on a listener the way an experienced professional can. Accordingly, AI mixing solutions are presently most useful as timesaving "shortcut" tools for mix engineers to set baseline equalization and dynamics processing settings—sonic "templates" for each track that are then adjusted according to the needs of the mix.[293]

Current AI *mastering* solutions are more compelling, as mastering is arguably more technical and subject to more limited variables than mixing. Mastering, therefore, is more easily automated than other stages of the recording process. Accordingly, numerous affordable online AI mastering services exist, which will analyze and digitally process an uploaded file in seconds.[294]

To assess just how effective current AI mastering technology is, one music publication compared the results of four AI mastering services with those of a professional mastering engineer.[295] They concluded that the AI mastering results were "impressive" and "clearly a viable option" for artists.[296] Nevertheless, the author also expressed "misgivings" because

> every aspect of a music production project involves subjective judgements and choices that AI simply can't (as yet) make. Just because the mastering stage involves a lot of technical considerations, it does not follow that the process is entirely technical—it does in fact involve just as much creativity, and just as many finely-balanced judgements, as any other stage in the production process.[297]

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[292] Plugin Alley, *Pro Mixers Reveal WHY Mixes Sound Amateur* (YouTube, May 1, 2023), https://www.youtube.com/watch?v=QiBmQuz9yr4 [https://perma.cc/42QQ-PT49] (remarks of renowned mix engineer Chris Lord-Alge).

[293] *See* Alex Holmes, *How Sonible smart:EQ 4 Offers a Glimpse into the Future of AI Mixing*, MusicTech (Feb. 1, 2024), https://musictech.com/reviews/sonible-smarteq-4-review-future-of-ai-mixing/ [https://perma.cc/4BX7-MXJE] ("A simple click of the Learn All button whilst the track is playing, and 10 seconds later we're presented with a cleaner sounding mix, with resonances tamed and low-mid build-ups reduced. Is it perfect? Not quite, but as a starting point, it's very impressive, and ten minutes of fine-tuning later we have a decent and well-balanced mix that can be used as a springboard for further processing.").

[294] *See* Adams, *supra* note 289.

[295] *Id.*

[296] *Id.*

[297] *Id.*

This is the key reason, in Professor Priest's view, that AI mixing and mastering solutions still fall short of professional engineers: all the presently available AI solutions enable, and the finished product often requires, user customization.[298] Without a trained ear, neophyte users will be in the same boat with or without AI assistance—most will not know how much of what kind of processing is necessary to make the mix, and ultimately the song, work.

Our interviewees expressed similar views on the limitations of AI mixing and mastering solutions. They acknowledged that AI could replace professionals who provide "cookie cutter" mixing and mastering services to DIY artists in mainstream genres such as pop and hip hop.[299] They were unanimously skeptical, however, that algorithms will render high-level recording professionals obsolete.[300] In their view, the more unique or cutting-edge the artist, or the less mainstream the genre, the less likely generic AI-based solutions will suffice. Several noted that art is about evolving, pushing boundaries, and creating something new—a process quite

[298] For example, Apple Logic Pro X's AI mastering function offers users the choice of four sonic "characters" applied to the entire mix: "Clean," "Valve," "Punch," and "Transparent." They all sound markedly different. How is an inexperienced user to know which one will sound best on a variety of equipment? Moreover, the mastering dashboard offers deceptively simple controls for powerful processing adjustments including limiting, aural excitement, and stereo imaging ("spread"). Does the mix sound too bright with an exciter engaged? Too dull without it? At what point will increasing "loudness" overcompress the mix and audibly squash crucial dynamics? Will increasing or narrowing the stereo "spread" create phasing problems or make the mix sound strange on certain playback devices such as car or home stereo speakers, earbuds or a phone speaker? How is the inexperienced user to know?

[299] Interview with Paul "Willie Green" Womack, *supra* note 216 ("If fine is good, and if good enough is good enough, then [AI mixing solutions] will totally do the job. If you want something that's custom tailored to you, and to what you're specifically doing, I still feel like a human hand is necessary for that .... But when it comes to the decision of, 'Do I want a human or a machine to master my six-minute *avant garde*, tap jazz song?,' I might need to go to a person for that. And I do have those clients and that need that specific thing. I [also] have clients [whose music is] a little more locked into mainstream or preconceived notions. That's a little easier, then, [for AI solutions to handle]. But some people, some songs, some genres do need a little more of that ... human touch and nuance.").

[300] Notably, a 2019 study of AI mastering platform LANDR arrived at the same conclusion. *See* Jonathan Sternel & Elena Razlogova, *Machine Learning in Context, or Learning from LANDR: Artificial Intelligence and the Platformization of Music Mastering*, Soc. Media + Soc'y, Apr.–June 2019, at 16 ("[M]astering shows no sign of being automated out of existence, despite the claim of services like LANDR. If anything, they are offering mastering to clients who might otherwise not paid for it at all."). In a more recent blind test of more than 400 listeners conducted by musician Benn Jordan, masters by two top human mastering engineers beat out numerous AI mastering solutions. *See* Benn Jordan, *We Proved It: AI Mastering is a Waste of Money* (YouTube, Oct. 23, 2024), https://www.youtube.com/watch?v=wZRV2H4PK0Q [https://perma.cc/78Q3-D6DA].

antithetical to backwards-looking algorithms trained on yesterday's recordings. Genre-defining artists do not want their productions and mixes to derive from presets that make them sound like everyone else.[301]

AI tools can handle some *technical* aspects of the mixing and mastering process, but cannot replace the critical *creative* contributions of producers, mixers, and mastering engineers. Algorithms cannot discern on an artistic level what a song, performance, or mix needs.[302] They cannot replace the functions of a producer: they cannot, for example, coax more evocative performances from the artist or suggest unconventional stylistic directions or arrangements for a song. Algorithms are "not going to make abstract associations to further the art" in the way that a good producer or mix engineer can.[303] One interviewee referred to this as the "element of surprise" that she brings to a mix by experimenting and transgressing conventions.[304] Another interviewee—a producer and mix engineer—observed that even in the mastering process, having a creative understanding of the producer, mixer, and artist's intent is critical. In his experience, AI mastering solutions can easily "disrupt the intent of the mix and destroy it just like a bad mastering engineer does."[305] Indeed, the inherent genericness of algorithmic solutions ensures continuing demand for recording

[301] *See* Interview with Matt Hennessy, *supra* note 216 ("I think you're going to see talented artists … go through phases. They're going to be driving to get into that box [i.e., generic AI-based mixing solutions]. And … they're going to achieve some success. And then they're going to want to expand beyond the constraints of that box. And that high level is where I think you're going to still see good paying, high level expert jobs for engineers and producers.").

[302] *See* Interview with Mikael "Count" Eldridge, *supra* note 208 ("[Creative decision making ultimately] needs to be [done by] somebody who has an ear for it and understands and has enough experience to know when what they're doing isn't working, [and] how to make it better. And so, those [software solutions] are just tools. You need to know how to use them and, more importantly, when to use them and, most importantly, know when it isn't sounding good. Which sounds like the stupidest thing I've said all day, but it is the most important thing because you'd be surprised how somebody will come to me looking for advice. And I'll listen to it. 'I'm like, well, this doesn't sound good. Do you hear how that doesn't sound good?' ").

[303] Interview with Larry Crane, *supra* note 209.

[304] Interview with Maria Elisa Ayerbe, *supra* note 216.

[305] Interview with Larry Crane, *supra* note 209. In their study of LANDR's AI mastering platform, Sternel and Razlogova observe that one shortcoming of AI mastering is that it lacks the dialogic process that often occurs between human mix and mastering engineers. Instead of a mastering engineer creating a master appropriate for the mix, a mix engineer who plans to use AI mastering must experiment to create a mix whose qualities will endure the changes imposed by the mastering algorithm: "the engineer cannot talk to the algorithm, and the algorithm cannot provide a satisfactory explanation for the problem [with the master] that the mix engineer hears." Sternel & Razlogova, *supra* note 300, at 15.

professionals.[306] Artists who seek a creative edge will relish the opportunity to work with talented human beings for artistic collaboration and inspiration.[307]

Our interviewee who specializes in Latin music mixing also expressed concerns about the cultural hegemony inherent in presets and algorithms programmed by American software engineers: "Let's say, for example, they they've input 100,000 hours of salsa music into an algorithm. How does the algorithm know there's a difference between Panamanian salsa, NuYoRican salsa, Colombian salsa, and Cuban salsa? … Americans tend to frame everything into a little [stylistic box] …." Until algorithms "learn to think like actual, ever-evolving humans" they will fail, in her view, to align with the nuances of a rapidly evolving global music ecosystem with borderless, genre-bending influences.[308]

In short, the hype over AI mixing and mastering tools outpaces the technological reality. It is far from clear that using AI-based mixing and mastering tools alone, at the time of this writing, can create professional-caliber results for most recordings. This may well change as technologies improve. However, the bottom line is that democratization's dawn has yet to arrive.

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[306] Interview with Matt Hennessy, *supra* note 216 ("[I]f you're cool living in the relative box that the AI has been programmed with to do, yes, it's going to sound incredible …. If you want something not within those parameters, the AI will not be able to do that whatsoever …. Now, in ten years, what's the number of people that are going to want to live in the box and live outside of the box? I can't tell you. I would guess that more will want to be inside than outside. But there will always be people that want to be outside of that box. And so, I do believe that there will always be a market for very talented engineers. The number of viable jobs, though, will drop, and those low-level jobs where people are doing the data-entry engineering, those are all going to go away.").

[307] Interview with Paul "Willie Green" Womack, *supra* note 216 ("I feel like it's a little scary, artistically, to find overall solutions for art, where so much of it is so personal …. [For] every song, I can use the same gear and the same [software] plugins but every choice I make is still being dictated by the one unique thing … which is the song.").

[308] Interview with Maria Elisa Ayerbe, *supra* note 216. Ayerbe also worries about the potential for genre-based AI mixing and mastering solutions to homogenize and stagnate cultural. *Id.* ("How do you know if I'm doing an R&B [track] … if I'm doing salsa, if I'm doing a classical piece, if I'm doing rock? … [G]enre is … impossible to teach to an algorithm because it's an ever-evolving thing. Cultural conventions come attached to it, and then it comes back to taste. So, I believe the difference between an actual music industry professional that has experience, and somebody that just pushes the button, is that inherent taste and genre appropriation that comes with your background … as a human, which is something that people are paying for ….").

3. Self-Serving Bias?

In sum, our interviewees opined that despite the widespread availability of inexpensive recording tools, recording and producing most modern music is highly complex, requiring many nuanced skillsets. While DIY artists can learn the skills to record, produce, edit, mix, and master, it takes a long time—usually years—and experience working on many projects to achieve mastery of any of the recording stages, let alone all of them. Moreover, while AI-enhanced recording software could eventually displace some professionals in the business, our interviewees unanimously maintained that the market for recording professionals will remain healthy for the foreseeable future.

Cynics may respond that, "of course your interviewees would say all that." After all, their livelihoods depend on perpetuating a culture of dependency. Self-serving narratives founded on the mystique of sonic perfection encourage artists and labels to shell out their hard-earned earnings, which keeps such professionals employed.

To be sure, such vested interest remains undeniable. And there is doubtless some degree of psychological self-validation at play whereby professionals want to believe that their skills and expertise confer genuine benefits upon their clients. Against this, we note that many of our interviewees offer workshops or post "master class" videos teaching DIY artists home production skills. So, their interest is not entirely one-sided. Moreover, the accounts they offered us are nuanced. They noted that some tasks and some genres are more readily susceptible to DIY methods than others and acknowledged that a small minority of uniquely talented DIY artists can master the learning curve needed to produce artistically and sonically compelling recordings.

We also note that some of our interviewees comprised label executives who have a vested interest in *minimizing* recording budgets. For them, paying for professional recordings directly undercuts their bottom line. Especially for independent labels, controlling costs matter a lot. Yet, these executives affirmed the value of recording professionals. Their accounts largely echoed the views expressed by other interviewees. They did not deny the existence of transcendent artists that can do it all themselves, but they stated that in their experience such artists are outliers. Most of their artists benefit artistically and commercially from working

with experienced producers and engineers, and thus labels continue to pay for these services.

C. Ten Thousand Musicians Can't Be Wrong

Furthermore, even if one discounts the foregoing accounts as riddled by bias or outdated industry mindsets, the fact remains that the producer and engineers we spoke to have no shortage of paying customers. Many of these are impecunious artists who are voting with their pocketbooks in a clear signal of confidence. It's easy for ivory-towered academics to celebrate the democratizing potential of digital home recordings. But thousands of actual musicians working in the trenches see things otherwise. That they are willing to hand over their hard-earned cash to enlist professional assistance speaks loudly to the enduring value that producers and engineers offer.

Two decades into the digital revolution, DIY music recording is hardly a new phenomenon. Aspiring musicians can choose from myriad blogs, YouTube videos, podcasts, and other "how to" guides, all of which celebrate the virtues of home recording and help aspiring musicians navigate the technical hurdles of every facet of the process from tracking to mastering.[309] Therefore, choosing to hire professionals is hardly a matter of ignorance. Indeed, our interviewers noted that many of their clients have experimented with home recordings. Having tried the DIY route, these musicians were unsatisfied with the results and willing to put their hard-earned money on the line because they recognized that professional help would take their music to a higher level.[310]

[309] On YouTube alone there are thousands of instructional videos from experts covering in depth every nuance of the recording process for virtually every conceivable genre of music. Indeed, at least four of our interviewees—Ayerbe, Womack, Borujow, and Crane—have shared their expertise in multiple detailed YouTube tutorials or podcasts about the recording, mixing, and mastering processes.

[310] Interview with Larry Crane, *supra* note 209 (observing that many of his mixing clients and students are people who "were pretty invested" in the recording process themselves before hiring him); Interview with Matt Hennessy, *supra* note 216 ("[DIY artists hire us because] the sound that they're trying to achieve is beyond their reach with the things that they can do, whether it's their skill set, whether it's their equipment, whether it's their imagination. They hear a sound that they want, or they've heard a sound that they want on a record that they are familiar with, or they just hear a sound that they're not able to achieve. And so they'll come to try and get it."); Interview with Ariel Borujow, *supra* note 216 (giving example of a client who "spends a lot of time developing and mixing independently and working independently" but hires Borujow for mixing "because he knows I'm going to deliver on his ear and his vision").

Many musicians also appreciate the value of specialization and division of labor. Sure, they *could* do their own home recordings, mixes, and masters. Yet, investing the time and effort required to acquire a whole different skillset and immerse themselves in the technical minutiae of audio engineering may not make sense, from the standpoint of both efficiency and cognitive demand.[311] Expecting DIY musicians to master the complexities of home recording along with all the other tasks that digital disintermediation entails leaves them with less time to focus on songwriting and musicianship.[312] As one independent label executive told us, when burgeoning DIY artists sign with her label and have access to a professional recording budget, "They're like, 'Oh, thank God, I don't have to do this on my own anymore!' "[313]

As producer and mixer Count commented, while DIY recording may be "empowering [for some], few artists truly have the resources, time, and desire to learn all phases of music production, and few artists/performers are even capable of becoming experts in all of these tasks."[314] It's enough of a challenge to excel at a traditional musical career without also taking on the demands of production, recording, editing, mixing, and mastering.

Artists whose heads are distracted by the technical details of acoustic engineering may not deliver their best performances. The luxury of delegating these chores to experienced professionals allows an artist to focus on their core responsibilities: composing and performing.[315] Moreover, as noted, recording professionals do more than handle the technical aspects: They can help artists

[311] Interview with Larry Crane, *supra* note 209 ("[T]here's always someone somewhere pushing [the artist creatively] on a great record. And when people tackle every single thing on their own—they're micromanaging their career on Facebook and Instagram and they're trying to micromanage the production of their album—they're probably losing some massive, massive part that could have been improved."); Interview with Matt Hennessy, *supra* note 216; Interview with Ariel Borujow, *supra* note 216; Interview with Mikael "Count" Eldridge, *supra* note 208.

[312] Interview with Mikael "Count" Eldridge, *supra* note 208.

[313] Interview with Christina Johns, *supra* note 202.

[314] Interview with Mikael "Count" Eldridge, *supra* note 208; *see also* Interview with Christina Johns, *supra* note 202 (observing that, in her experience, many DIY artists are DIY "usually out of necessity [rather than by choice]; it's like, 'I don't have the money [to record], but I do have a computer,' … and so I think they do it to get to the next level").

[315] Interview with Mikael "Count" Eldridge, *supra* note 208. Indeed, Larry Crane gives the example of celebrated artist and producer Steven Wilson who hires a producer when he records his own vocals because the producer pushes him to get better, clearer takes. "In the end," Crane recalls Wilson telling him, "all the

improve all aspects of a song, including lyrics and arrangement, coaxing an inspired vocal performance, or functioning as a set of expert ears whose feedback and suggestions can push artists to achieve their best work.[316]

The producers and engineers we spoke to are hardly a dying breed, nor are their customers drawn from a dwindling pool of deluded souls who swallowed the studio recording Kool-Aid. Tens of thousands of music producers and recording engineers ply their trade in the United States alone.[317] Indeed, the field is growing: Digital democratization has made it easy for anyone to open a virtual studio and cater to wannabe-musicians.[318] Despite this influx of competition, salaries remain robust: engineer salaries in the recording industry averaged $61,582 in 2022.[319] There is clearly no shortage of demand for their services. Far from being an obsolete industry that digital tools have supposedly replaced, the market for professional assistance remains robust. Again, musicians are voting with their pocketbooks, rejecting DIY recording notwithstanding the much-hyped promise of the digital revolution.

D. The Stubborn Persistence of Recording Costs

Our interviews shed light on the effect of digital democratization in another respect: We explored the costs and time required to complete the recording process and asked interviewees whether digital technologies had altered these metrics significantly. While interviewees gave a range of estimates, overall, their accounts suggest that, here too, the effects of digital technologies have been significantly overstated.

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vocals are better for it" despite that Wilson himself is a seasoned producer. Interview with Larry Crane, *supra* note 209.

[316] Interview with Larry Crane, *supra* note 209; Interview with Ben Kline, *supra* note 237.

[317] Jessica Peresta, *How To Become a Music Producer: A Complete Guide,* INDEED (July 24, 2023), https://www.indeed.com/career-advice/career-development/how-become-a-music-producer (https://perma.cc/T3SG-PELV); *Occupational Employment and Wages, May 2022 - 27-4014 Sound Engineering Technicians,* U.S. BUREAU OF LABOR STATISTICS, Apr. 25, 2023, https://www.bls.gov/oes/current/oes274014.htm [https://perma.cc/DEN8-2JKC].

[318] Interview with Mikael "Count" Eldridge, *supra* note 208. Numerous websites such as Landr, Fiverr, and Soundbetter showcase thousands of recording professionals for hire. Like most of our interviewees, these professionals work with home recordists who are willing to pay someone with greater knowledge and skill to mix, edit, or master their recordings.

[319] *Occupational Employment and Wages*, *supra* note 317.

Contrary to the digital evangelist claims, the costs of recording have not disappeared.[320] The costs to professionally record, mix, and master a music track at commercial caliber quality total easily in the thousands of dollars, with higher-end productions costing in the tens of thousands or much higher.

Our interviewees with knowledge of the subject cited $40,000–$50,000 as a typical price range for recording, editing, mixing, and mastering a ten-song album today.[321] Album budgets up to $300,000 are not unusual. At the highest end of the spectrum, recording budgets for premier major and independent label artists can still range from $500,000 to over $1 million per album. The bottom of the range for label album budgets, including indie and major labels, is about $20,000–$25,000 per ten-song album. The rock-bottom range cited by our interviewees for independent artists recording tracks at home without a producer but paying a mixing and mastering engineer is between $8,500–$10,000 per ten-song album for commercially competitive results.[322]

Compared to the pre-2000 analog era, costs have declined somewhat, but the savings are nowhere near as dramatic as copy skeptics suggest. Studios do charge somewhat less than they did twenty years ago, reflecting reduced equipment costs and fewer support staff.[323] In this respect, digital technologies have had a clear effect. Tracking is also the facet of the recording process most susceptible to DIY

[320] By contrast, distribution costs clearly have declined dramatically—one label executive we spoke to described a 75% reduction in the costs of distributing new music compared to the prior era based on physical media. Interview with Ben Kline, *supra* note 237. Yet distribution was never the major cost factor in music production.

[321] Most of our interviewees had direct knowledge of recording budgets, and all of those who discussed recording budgets requested anonymity with respect to that information.

[322] If one were to add a producer at $1,000 per song, the price of the ten-song album would increase to about $20,000, in line with what was reported as the bottom of the range for recording budgets.

[323] Interview with Mikael "Count" Eldridge, *supra* note 208; Interview with Ariel Borujow, *supra* note 216 (observing that because technology enables him to mix in his home studio, he does not incur the overhead of large studios of yore and can pass those savings on to clients).

disintermediation.[324] Therefore, competitive pressures from home recording may also have played a factor.

Despite this, commercial studio space remains in high demand.[325] And the costs of other professional services have hardly budged. The main costs of recording, mixing, and mastering music derives from the labor of specialized producers and engineers. These costs have not changed significantly, at least where experienced professionals are concerned.[326] Public sources note that professional mix engineers charge between $100 per song for less experienced mix engineers to $3,000 per song for well-known mixers with credits on major hits.[327] "Superstar" mix engineers can charge $10,000 per song or more.[328] Mastering engineers charge from $25 per song for relatively inexperienced engineers to $150–$350 per song for top mastering engineers with major credits.[329] Producers' rates are more variable

[324] *See* Interview with Paul "Willie Green" Womack, *supra* note 216. However, our interviews are rife with examples of DIY tracking that turned out to be unusable at the recording stage or where the project stakes are too high to take the risk of DIY tracking. *See, e.g.*, Interview with Matt Hennessy, *supra* note 216 (recounting examples in which DIY artists tracked in echoey living rooms with background noise rendering vocal tracks unusable, or unwittingly tracked all drums monophonically rather than stereophonically—a mistake essentially unfixable at the mixing stage); Interview with Larry Crane, *supra* note 209 (observing that DIY recording is patently inappropriate for some projects, for example, when there is a professional featured artist and there is no margin for error: "The reason they're [recording vocals in a studio] is because you're dealing with someone whose time is precious, and the results have to be perfect .... [S]o you don't go and just cobble it together in somebody's living room and hope that the dogs don't bark [or] the lawnmower doesn't come out.").

[325] *See supra* note 324 (describing pitfalls of home recording and noting reasons why artists and producers still book studio time to record); Interview with Paul "Willie Green" Womack, *supra* note 216 (noting his studio competes with "hundreds" of studios in the Brooklyn area alone). Many artists still book studio time to benefit from professional feedback and recording expertise, access more artistically inspiring equipment and environs, or leave technical processes to others so the artist can focus on delivering their best performance. *See* Interview with Mikael "Count" Eldridge, *supra* note 208; Interview with Larry Crane, *supra* note 209; Interview with Matt Hennessy, *supra* note 216; Interview with Paul "Willie Green" Womack, *supra* note 216.

[326] Interview with Mikael "Count" Eldridge, *supra* note 208; Interview with Matt Hennessy, *supra* note 216 (noting that, while technology has made the price of equipment more affordable, the amount the interviewee charges for his services would be the same today as they would have been in 1999).

[327] *See* Love Science Music, *Typical Rates for Recording, Mixing, Production, Mastering* (YouTube, May 28, 2024), https://www.youtube.com/watch?v=d3cYk9NMn1s [https://perma.cc/4Q8H-8K27] (video by Josh Giunta, Grammy-winning producer, engineer, mixer, and Berklee College of Music professor, explaining typical industry professional rates); Justin Colletti, *How Much Should a Mix Cost?*, Sonic Scoop Podcast (Feb. 4, 2021), https://sonicscoop.com/how-much-should-a-mix-cost/ [https://perma.cc/MN9U-ZWZL].

[328] Love Science Music, *supra* note 327.

[329] *Id.*

because some are paid with royalties, but in general, producers' flat fees range from $100 to $1,000 per song, or considerably higher for producers with major credits.[330] We also asked our interviewees about recording professional rates. Although most requested anonymity with respect to discussion of specific rates, their observations closely aligned with the rates reported above.

The continued demand for top producers and engineers has held up despite an influx of competition.[331] Not only do these professionals have to compete against DIY and AI-based alternatives, but the professional supply side, too, has been digitally democratized. The reduced entry costs to opening a studio or hanging a professional shingle as a producer or engineer have brought steep competition at the entry level of the market.[332] The recording industry also endured a decades-long decline of revenues due to illegal filesharing starting in 2000 from which it has only recently begun to recover.[333] Lower revenues meant less money to spend on recording budgets.[334] Accordingly, there are multiple factors potentially driving down the fees that recording professionals can charge, of which digital democratization is only one.

Despite these downward pressures in the market, as noted above, top professionals still command top dollar.[335] Their time and experience cost money. Digital tools cannot replace them and deliver comparable quality, and aspiring musicians value the benefits they offer and are willing to pay for them. To be sure, critics will argue that the premium rates top engineers and producers command derives more from superstar market hype than inherent quality, and there is doubtless some truth to this. However, the fact remains: if digital technologies

[330] *Id.* Norms around whether the producer receives royalties for their work on a recording can vary by genre. For example, royalty deals for rock producers are less common, so rock producers may charge a higher flat fee up front than hip hop producers. *See* Interview with Mikael "Count" Eldridge, *supra* note 208.

[331] *See* Interview with Ariel Borujow, *supra* note 216 ("[A]ll these independent artists are making music, [so] there's more work to go around. There's more engineers too. But usually, the bad ones get weeded out.").

[332] Interview with Paul "Willie Green" Womack, *supra* note 216; Interview with Ariel Borujow, *supra* note 216.

[333] Interview with Ben Kline, *supra* note 237 ("[The year] 2000 was … the high-water mark for revenue for the recorded music industry. And from that technology, notably Napster, we saw the decline that, until [2017] … hadn't started to level off, although we're still at 60% of the revenue that we were at in 2000.").

[334] *Id.*; David Lowery, *Meet The New Boss, Worse Than the Old Boss?*, Trichordist (Apr. 15, 2012), https://thetrichordist.com/2012/04/15/meet-the-new-boss-worse-than-the-old-boss-full-post/ [https://perma.cc/4Q8H-8K27] (attributing lower recording expenditures to budgetary pressures).

[335] *See supra* notes 328–330 and accompanying text.

delivered the emancipatory solutions that pundits promised, disintermediation should have destroyed this market entirely. It manifestly has not.

Nor has technology markedly reduced the time associated with many music production tasks, which remain labor-intensive tasks and require hands-on experimentation to find customized solutions: for example, auditioning the right keyboard sounds, getting good drum and guitar sounds, working on the right/tight arrangements, and working on vocal takes and editing.[336]

Technology has also *increased* some costs. Today every note, drum hit, and vocal line can be tuned and quantized to perfection. Engineers and producers spend huge amounts of time editing sloppy instrument and vocal tracks to make them technically perfect.[337] Audience ears have become accustomed to such flawless engineering.[338] Thus, foregoing such optimization is not commercially viable. Technology has trained the market to set a higher bar.[339]

Moreover, as noted, DIY artists' recordings typically arrive chock full of flaws.[340] Moreover, the ability to digitally record endless takes and capture multiple tracks individually creates its own challenges. Just as our camera rolls often fill with multiple, often duplicative snapshots and selfies that take time to sort through later, so, too, editors and mixers frequently need to sort through a much bigger pile of recorded tracks than they did in the analog era where artists labored under the

[336] Interview with Mikael "Count" Eldridge, *supra* note 208 ("It's a great misconception that people have that, 'Oh, everything's a lot quicker and cheaper now.' And certain aspects are a little cheaper. A handful of things are a little quicker. But a lot of the things are exactly the same amount of time.").

[337] *See* Interview with Matt Hennessy, *supra* note 216 ("I spend more time tuning R&B vocals than we spend recording the R&B vocals."); Interview with Larry Crane, *supra* note 209; Interview with Paul "Willie Green" Womack, *supra* note 216; Interview with Mikael "Count" Eldridge, *supra* note 208.

[338] Interview with Matt Hennessy, *supra* note 216 ("We're so used to things being very gridded to the click, and we're [so] used to things being very tight on the pitch, that the average listener now is more tuned into these things .... There is definitely an expectation that things need to be very, very tight compared to how they used to be. And that takes time. And there's a cost [to] that.").

[339] *Id.*; Interview with Paul "Willie Green" Womack, *supra* note 216; Interview with Larry Crane, *supra* note 209 (noting the added time and cost resulting from the micro-editing that today's technology enables, whereas in the analog recording era, producers and artists often just ignored minor performance imperfections because micro-editing capabilities were unavailable).

[340] Interview with Larry Crane, *supra* note 209 (observing that when he mixes "a lot of those home recorded or self-recorded, whatever, things that people are sending me, 75% of it is more of a rescue job than a fine-tuning job," and noting that most of these recordings suffer from a common set of neophyte mistakes).

discipline of steep hourly studio recording fees.[341] Selecting from a patchwork of recorded stems and sounds and integrating these inputs into a coherent whole can be challenging. Stitching together different components recorded in different times and spaces whose acoustic qualities differ can cause added complications.[342] Thus, the time and money saved on home recording is frequently offset by increased need for editing and cleanup.[343]

The need to accommodate the diversity of playback media and acoustic settings that modern music consumption encompasses has also brought added challenges. In past eras, record labels focused on producing music for a single dominant format—first vinyl, then cassette tapes, then CDs. Now, people consume music in a multiplicity of formats both physical and virtual. Each streaming service employs its own compression algorithm, each presenting its own challenges.[344] Listening devices also span a wide gamut, from cheap earbuds to sophisticated speakers. Skilled mastering engineers strive to make recordings sound equally compelling across this enormous diversity of acoustic settings and also meet the disparate technical specifications of each. Finding the right balance takes time.

[341] *See* Interview with Mikael "Count" Eldridge, *supra* note 208 ("[S]imply the ability to record as much stuff that you could possibly fit into a song [is a problem that has] emerged that didn't exist before. So, I have to spend at least a day editing the performance, but then also subtracting, going through, and just figuring out what I'm not going to use in a song because the band has recorded way too much stuff .... So, there's a reduction process that has to happen now that was unthinkable thirty years ago.").

[342] *See, e.g.*, interview with Maria Elisa Ayerbe, *supra* note 216 (discussing how new recording technologies enable her to record in suboptimal conditions, but that doing so increases complexities at the mixing stage that require a high level of expertise to "pull it through").

[343] Interview with Larry Crane, *supra* note 209 ("[T]he more problems that a mix has from the get-go, the less time I have to be creative. I'm [spending my time] in iZotope RX [audio repair software], and I'm taking all the plosives off your vocal track. And I'm removing all the clicks and the air conditioner noise and the sirens and the stuff that's in the background of your vocal track .... I mean, I've spent more time in iZotope RX cleaning up the tracks than I've spent mixing in Pro Tools. Well, if ... you're spending so much time just trying to get the tracks workable, then really, what's the point of ... fine tuning it? It's like you're just trying to save it.").

[344] Interview with Patrick Amory, *supra* note 237 ("[P]eople have to optimize their music to be heard through so many different platforms, outlets, systems. I mentioned vinyl, but the fact is that Spotify takes your shit and has its own compression algorithm that it applies. There's obviously HD audio sites, but then Apple and Amazon want spatial audio. You, the mixing and mastering engineers, have to somehow figure out a way to come up with files that can sound decent through all of these outlets, and also hopefully sound good on a decent stereo system or surround sound system as well as headphones, earbuds, car stereos, whatever it is. I mean, I don't see it getting simpler.").

This, too, requires more attention and craft than in decades prior.[345] Accordingly, a label executive we interviewed noted that high-end mastering prices have "completely ballooned over the past five to ten years."[346]

Once again, a nuanced picture emerges—with some costs having declined, others having gone up. Overall, there seems to have been a slight reduction in the cost of professional recordings—somewhere in the range of 10–40%, but nowhere near the drastic declines that commentators claim.[347] If digital technologies were as powerful as advertised and if the time savings they yield were as dramatic as claimed, one would expect far greater reductions. Skilled professionals might still command high hourly rates, but the efficiency gains from going digital should have sharply reduced aggregate costs. And the presumed rapid uptake of DIY alternatives should exert its own downward cost pressure. After all, if musicians could get by just fine without shelling out for professional help, they would do so, creating a demand squeeze that reduces commercial prices. That none of this has happened should cause us to question the premises of the digital democratization narrative.

The putative lower costs of DIY alternatives themselves deserve scrutiny. Copy skeptics generally describe home recording as virtually cost-free: you just need a laptop, a microphone, and some inexpensive software. To be sure, laptops and software cost a fraction of the million-dollar consoles of the analog era. However, additional start-up costs remain unavoidable. For the DIY artist who plans to record, mix, and master their music, a quality microphone, a quality analog-to-digital interface, studio monitors for mixing, and studio headphones, at a minimum, remain essential.[348] Treating a home recording space to optimize its

[345] *Id.* (noting that because of the technical complexity arising from today's varied audio formats and streaming outlets, the "[c]hoice of mastering engineers [is] hugely important to artists and [selection of the mastering engineer is] a conversation that we're always very, very closely involved in very much from a viewpoint of trying to control costs these days, because [mastering] used to be a relatively low-cost add-on to the process ….").

[346] *Id.*

[347] Estimates among our interviewees varied, but all of them affirmed that recording costs remain significant.

[348] Interview with Maria Elisa Ayerbe, *supra* note 216 ("[O]n top of [headphones] and a great sounding room with a with a great sounding set of speakers that you understand … it comes down to having a computer with good plugins and having a good interface. Ignoring everything else, I'd say [the commercially competitive home studio start-up cost] is probably about $6,000.").

acoustic qualities can require further expenditures.[349] All told, the bare minimum set-up costs for DIY recordings can easily total two to three thousand dollars.[350] Most serious home recordists spend far more—many thousands of dollars—on higher-grade hardware and software plugins.[351] Recording more complicated music genres or larger ensembles can push costs further upward.[352]

In any case, the main costs of music recording—whether done at home or professionally in a studio—are bound up in time and labor costs. Time is money, and even DIY artists face implicit opportunity costs for their time. For musicians to function as anything more than casual hobbyists and position themselves for career success, the need to focus is imperative. Time spent mastering the technical minutiae and experimental craft of recording means time taken away from musicianship. As we have seen, DIY artists face a steep learning curve to get anywhere close to professional quality results. Even assuming they can master the different facets of the recording process, they are likely to spend far more time fiddling with their projects, navigating blind alleys, and grappling with the creative and technical challenges than a specialist who does this work day-in-and-day-out.

This is not to say that DIY recording is never the right path for an artist. Our interviewees cited examples of celebrated artists who achieved their distinctive sound through self-production and self-recording.[353] And for some artists, having this level of control and autonomy is both empowering and rewarding. Our

[349] Parsons & Colbeck, *supra* note 228, at 5–11.

[350] Interview with Mikael "Count" Eldridge, *supra* note 208. Admittedly, much of these are one-time start-up costs that can be amortized over multiple projects. Yet, for impecunious musicians, even these initial start-up costs can be daunting, and the temptation looms to cut corners and record under suboptimal conditions (which sets the artist up either for commercial failure or for follow-on costs to get professional help to clean-up the flawed initial recordings).

[351] *See id.* (estimating that a professionally competitive home recording setup costs between $2,500 and $10,000 with high quality microphones, high quality monitors, acoustic treatments, and so on); Interview with Maria Elisa Ayerbe, *supra* note 216 (noting that neophyte mixers lack the experience to identify and compensate for sonic deficiencies in budget speakers, so to be able to mix at a professional level they usually need truly transparent speakers that cost around $3,000 per pair, not to mention acoustical treatments).

[352] Interview with Mikael "Count" Eldridge, *supra* note 208 ("If you're doing a big rock band and you want to record proper drums, multitracked drums, … [the minimum] is $10,000, because you need to have a handful of mics, microphone preamps, and the computer and the software.").

[353] *See* Interview with Matt Hennessy, *supra* note 216 (citing example of Kevin Parker (Tame Impala), who produces and records his own music and has developed a distinctive sound using recording tools in unorthodox ways, but that such artists are "the rarest ones"); Interview with Larry Crane, *supra* note 209 (citing DIY artists such as Tune-Yards).

interviewees cautioned, however, that such artists are true outliers: only a tiny percentage of DIY artists have the natural ability and "ear" to execute on their vision more successfully than they could have done with professional help.[354] Everyone else can benefit from the assistance of professionals to help them execute on their vision.

Veteran indie rocker David Lowery has tried both DIY recording and outsourcing to professionals. He experienced "a massive productivity loss" when trying to record on his own.[355] He noted that

> it takes me 3 days on my own to mix a single song. A professional engineer[ ] would mix two songs a day. And they would sound way better. Tracking the drums, bass and instruments is way harder. I can probably do it, but I'd be lucky to turn out a single good take in a day. Whereas [professional] engineers would turn out 2–3 a day. [And] it would take days or a week to set up the recording equipment and get it all functioning correctly.[356]

Lowery estimated that if you value at minimum wage the added time required for his band to self-record an album, home recording becomes a *more* expensive proposition than hiring studio professionals.[357] As he summarized,

> magic digital unicorns don't change the productivity benefits of labor specialization .... Recording music on your own laptop is more expensive than hiring specialists and renting specialized facilities. Just as raising your own chickens in your backyard is a fancy way to pay more for eggs .... [W]e [shouldn't] be surprised [that DIY recording costs more when] everywhere else in the economy we see that labor specialization leads to higher productivity and lower costs.[358]

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[354] *See, e.g.*, Interview with Matt Hennessy, *supra* note 216 (estimating that, based on his experience working with inexperienced home recordists, "under five percent, for sure, but probably one to two [percent]" have the innate talent and skill to deliver a commercially competitive master recording).

[355] Lowery's perspective draws on his extensive experience in the recording industry as a musician, founder of his own indie label, a studio owner, and a producer of multiplatinum albums. He is also no stranger to technology, as an early adopter of digital recording and marketing, a former computer coder, systems operator, and financial industry "quant." Lowery, *supra* note 334.

[356] Email from David Lowery to author (October 16, 2018) (on file with author).

[357] *Id.*

[358] *Id.*

The reality is whether recording professionally or DIY, costs have not disappeared, and they are not going to any time soon. The stubborn persistence of costs and the enduring demand for professional services dovetails with our interviewees' accounts: far from being the magical panacea that democratization proponents claim, digital recording remains a complex process full of pitfalls and challenges that DIY artists struggle to surmount.[359]

Nor will AI necessarily prove a game-changer that alters this equation. To be sure, AI is capable of impressive creativity in the musical realm, as in many others. However, its strength lies in repackaging creative formulas that have worked in the past.[360] True out-of-the-box innovation still requires a human touch.[361] This applies to AI-mediated recordings, as well as to compositions.[362] While AI generated music certainly has a host of commercial applications, it is unlikely to top the music charts any time soon.[363]

In any case, the best AI creativity will almost certainly come from human-machine collaborations.[364] To be sure, sophisticated AI-mixing and mastering tools may continue to lower some of the costs of recording and improve the capabilities of DIY artists. Yet, at its core, AI is just a tool—albeit a powerful one. As we have seen with other digital recording innovation, such sophisticated tools yield the best

[359] Tellingly, even artists who succeed in self-recording a hit often choose to employ professional assistance on their subsequent releases. *See supra* note 138 (offering multiple examples).

[360] *The Dawn of the Omnistar: How Artificial Intelligence Will Transform Fame*, Economist (Nov. 11, 2023), https://www.economist.com/leaders/2023/11/09/how-artificial-intelligence-will-transform-fame [https://perma.cc/7WVA-MVRW] ("AI is brilliant at remixing and regurgitating old material, but less good at generating the pulse-racing, spine-tingling stuff that is, for now, a human specialty."). Indeed, the neural-network foundation of AI, almost by design, ensures a retrospective focus.

[361] *See id.*; Mika Koivisto & Simone Grassini, *Best Humans Still Outperform Artificial Intelligence In a Creative Divergent Thinking Task*, 13 Sci. Reps. 13601 (2023), https://doi.org/10.1038/s41598-023-40858-3 [https://perma.cc/633Z-4N93]; *see also* Farhad Manjoo, *Better Than AI: In the Battle with Robots, Human Workers Are Winning*, N.Y. Times (Oct. 7, 2022), https://www.nytimes.com/2022/10/07/opinion/machines-ai-employment.html [https://perma.cc/C4KW-XWM4].

[362] *See supra* notes 292–298 and accompanying text.

[363] *AI Did It My Way*, Economist (Nov. 11, 2023), https://www.economist.com/briefing/2023/11/09/now-ai-can-write-sing-and-act-is-it-still-possible-to-be-a-star [https://perma.cc/5DGP-EA3A].

[364] *See* Manjoo, *supra* note 361. AI can generate impressive creativity output, but it also has serious limitations and blind spots that humans can remedy. As a result, AI works best as a means to augment human capabilities. It is being used by artists today in many different ways: some use it as to develop creative stems into finished products, others use it at the front end to generate new ideas. *See* Alan Cross, *Music Generated by Artificial Intelligence is Coming to the Radio Sooner than You Think*, Global News (Oct. 16, 2022, at 09:00 ET), https://globalnews.ca/news/9193451/ai-generated-music/ [https://perma.cc/S7CJ-7HRW].

results when used by people who have the skills and experience to harness them effectively.[365] Recording professionals who master the ins and outs of AI systems and use them on a daily basis across a wide range of creative projects will inevitably have an edge over newbies just starting out.

AI could also increase costs and raise barriers in other ways. As we have seen already with overdubs, autotuning, and multitrack processing, the ability to do more to enhance the final product more can itself heighten the baseline expectations for the commercial state of the art.[366] As consumers become accustomed to a higher quality acoustic experience, recordings that fall short of such heightened standards struggle to compete. The availability of AI enhancements could similarly heighten expectations and thereby widen the gap between professional and DIY recordings.[367]

At the same time, AI's content creating potential will unleash a new flood of music that promises to expand the already staggering existing volume of new releases.[368] Streaming platforms may favor machine music to avoid paying royalties.[369] The abundance of content is already causing consumers to gravitate paradoxically to well-known stars and brands.[370] Fledgling musicians will have to struggle harder than ever to be noticed. Cutting corners on recording quality and post-production refinements may prove an impossible handicap to bear in an era where real music increasingly "drown[s] in a 'sea of noise.' "[371]

AI could change music business models in other ways that widen the gulf between professional and amateur offerings. For example, the emergence

[365] With chatbots, for example, it is already clear the quality of output you get depends dramatically on the textual prompt entered. *See* Shubham Saboo, *Prompt Engineering: The Career of Future*, MEDIUM (May 10, 2021), https://medium.com/nerd-for-tech/prompt-engineering-the-career-of-future-2fb93f90f117 [https://perma.cc/2964-YTCH]. Music is no different.

[366] *See supra* notes 337–339.

[367] By reducing entry costs to creating music, AI could also increase competition at the bottom end of the market, further eroding the commercial viability of DIY creators. *See supra* notes 299–301 and accompanying text (discussing how AI mixing and mastering software could provide instant, cheap "cookie cutter" solutions to indiscriminating artists).

[368] *AI Did It My Way*, *supra* note 363.

[369] *Id.*; Cross, *supra* note 364; PELLY, *supra* note 170 at 126, 135 (discussing Spotify's interest in developing AI music generators that would create unending streams of royalty-free music).

[370] *See AI Did It My Way*, *supra* note 363; Michal Shur-Ofry, *IP and the Lens of Complexity*, 54 IDEA 55, 64–67 (2014) (explaining such consumer behavior as a complexity-managing heuristic).

[371] *AI Did It My Way*, *supra* note 363.

of AI-enhanced virtual avatars and virtual bands could revolutionize artist-fan interactions.[372] Virtual concerts and other novel experiential models could allow top artists to expand their presence far more pervasively by overcoming the physical limitations that touring imposes.[373] Such immersive technologies could further heighten the premium placed on high-quality recordings.

Such trends turn on the head the notion that selling music as an experiential good will replace the need to monetize recordings as a product. Copy skeptics have long argued concerts can replace recordings as the main drivers of music revenue, thereby obviating the need to restrict unauthorized copying.[374] However, as concerts go increasingly virtual, recordings will effectively *be* the concert; copyrighting such assets will remain as important as ever.

New technologies could also raise costs and widen the gulf between professionals and DIY upstarts in other ways. For example, the widespread adoption of the Dolby Atmos audio format is already increasing the costs and complexity of many recording projects. Dolby Atmos "lets engineers create a listening experience more immersive than traditional stereo by placing sounds around and above the listener."[375] Separating sounds spatially creates an acoustic experience with enhanced depth and clarity. Such "spatial audio" recordings allow engineers to paint with a broader palette.[376] However, as with any new technology, using it effectively requires a learning curve.[377]

Most of today's biggest music releases already come with a Dolby Atmos mix alongside the traditional stereo version.[378] Major streaming services such as Apple

[372] *See id.*; Julie Yoonnyung Lee and Amelia Hemphill, *K-Pop: The Rise of the Virtual Girl Bands*, BBC (Dec. 11, 2022), https://www.bbc.com/news/world-asia-63827838 [https://perma.cc/G73D-2DC6].

[373] *AI Did It My Way*, *supra* note 363; *see also Omnistar*, *supra* note 360 ("AI will make the biggest celebrities bigger than ever, by allowing them to be in all markets, in all formats, at all times.").

[374] *See*, *e.g.* Lemley, *supra* note 23, at 489; Mark F. Schultz, *Live Performance, Copyright, and the Future of the Music Business*, 43 U. Rich. L. Rev. 685, 696–97 (2009) (summarizing such arguments).

[375] Bob Mehr, *Dolby Atmos Wants You to Listen Up. (And Down. And Sideways.)*, N.Y. Times (June 21, 2023), https://www.nytimes.com/2023/06/21/arts/music/dolby-atmos.html [https://perma.cc/7B6A-2DAE].

[376] *Id.*

[377] *Id.*; *see also supra* note 283 (noting how Dolby Atmos mixing involves a steep learning curve even for professional mix engineers).

[378] Chris Welch, *Apple Might Soon Pay Artists More for Offering Their Music in Atmos,* Verge (Dec. 11, 2023), https://www.theverge.com/2023/12/11/23996735/apple-music-spatial-audio-atmos-higher-royalties [https://perma.cc/MW2D-5LUU].

Music are incentivizing recording in Dolby Atmos through enhanced royalties, and its uptake continues to expand.[379] If Dolby Atmos emerges as a dominant format, it could further accentuate the advantage that experienced recording professionals enjoy over hobbyists and DIY upstarts.[380]

To be sure, predicting the future of any particular technology is fraught with risk. However, the point here is merely that we should not assume that the recent trend line of reduced costs and enhanced DIY capabilities that digital technologies supplied will continue. New technologies and emerging business models could easily push in the reverse direction. In other words, the democratization of the music industry is far from irreversible.

Conclusion

Technology-enthused copyright skeptics have concocted an attractive narrative of digital democratization. In their telling, DIY musicians can rely on inexpensive software to fully replicate the capabilities of a professional studio. Freed from the oppressive hegemony of record labels and liberated from a dependence on recording engineers, digitally empowered artists can create music exactly the way they want, working at their own speed, on their own time, in their own space. Disintermediating creativity will not only put more money in artists' pockets, it will lead to better, more authentic music. The recording industry as we know it may disappear, but society will be better off.

Like all good fables, the democratization of music has its elements of truth. Digital tools have clearly encouraged a proliferation of amateur artists and wanna-be professionals. They are turning out DIY music in huge volumes and sharing it with the world on an unprecedented scale. Such an outpouring of creative expression doubtless has intrinsic value on many levels.[381] However, if we focus on commercially viable music, that is, music that people actually *listen* to in large numbers, then here the democratization story falters. Very few artists are

[379] Amrita Khalid, *Apple Tells Artists How Much More Money They Can Make with Spatial Audio*, Verge (Jan. 22, 2024), https://www.theverge.com/2024/1/22/24047461/apple-music-spatial-audio-royalties-dolby-atmos-streaming [https://perma.cc/7FVH-MKF6].

[380] *See* Interview with Ariel Borujow, *supra* note 216 (predicting that Dolby Atmos is "the future … the new stereo, and stereo is going to become the new mono").

[381] *See* Pager & Aujla, *supra* note 22, at 1119 (describing the benefits of digital expression in empowering diverse voices, encouraging experimentation, and providing representation to marginalized communities).

capable of self-producing music recordings of sufficient quality to compete with professionals. And audiences overwhelmingly vote with their dollars (and ears) for professional productions.

Our analysis of 766 tracks that made it onto the weekly top 200 charts from 2020 to 2023 reveals a striking absence of DIY tracks: at most one percent. In other words, the most popular music today—music that worms its way into our ears and provides the soundtrack for our daily lives—is overwhelmingly produced by recording professionals. Commentators boasting that "anyone can be the next Justin Bieber" and achieve viral success entirely on their own are vastly overclaiming. In fact, even Justin Bieber didn't do that,[382] and the path to DIY success remains fraught with obstacles.

What explains this failure of digitally disintermediated musicians to crack the highest echelons? Part of the answer may be the enduring clout of record labels in pushing their product onto playlists. However, our research suggests that a bigger part of the story is the intrinsic difficulty of producing recorded music on a DIY basis. Simply put, producing high quality records is far more complicated than fiddling with a few knobs and pressing "record." Achieving commercial quality recordings involves a technically complex, multistage process from tracking to mixing to mastering, all of which fledgling musicians struggle to master.

Nor has technology served as the leveling agent that commentators frequently claim. To be sure, digital tools, including AI, offer powerful capabilities that have lowered some barriers. Yet, using them effectively remains a time-intensive process that is as much an art as a science. Experts who use these tools day in and day out will always have an edge over those starting out, and DIY musicians seeking to be a jack of all trades inevitably end up masters of none.

This should not surprise us. The logic of specialization applies to music recording as much as to any other industry. We don't expect film directors to simultaneously serve as cinematographers, costume and set designers, make-up artists, as well as take on all the other myriad tasks that go into making a motion picture, from screenwriting to special effects.[383] We understand that delegating

[382] *See* Hoffman, *supra* note 143.

[383] There's a reason why the credits rolling after feature films go on for several minutes (and why the Academy Awards show lasts for hours).

these responsibilities to specialists leads to higher quality movies. Why should music recording be any different?

To be sure, a few exceptional artists are capable of mastering DIY production. And doubtless some welcome the autonomy and control that producing their own recordings affords. However, for most artists, the value of delegating the technical challenges of the recording process to experienced professionals far offsets such benefits. Moreover, enlisting additional sets of ears to provide feedback and tapping the talents of multiple creative minds to polish a recorded track to perfection yields demonstrably better results, as our chart data makes clear.

Achieving even modest levels of commercial success on a DIY basis remains out of reach for most artists. They struggle to attain even the bare minimum recording quality required to compete, let alone to realize their music's full potential. Instead, for many, the embrace of home recordings is driven by budgetary necessity more than intrinsic preference. Many artists know they risk subpar results by foregoing professional assistance. Their continued willingness to pay for professional recordings when they can afford to do so testifies to the perceived value that producers and engineers offer, notwithstanding the putative democratization of music.

In short, the digital disintermediation that pundits have predicted for over a decade remains nowhere in sight. Reports of recording professionals' demise have been greatly exaggerated. Far from being superseded by technology, their skills remain much in demand. Moreover, contrary to commentator claims, the time and costs required to produce commercial quality records have not disappeared. Producing great music still requires great skill, effort, and time—and talented professionals still command top dollar.

Indeed, instead of empowering DIY creativity, digital technologies may supply new sources of inequality that exacerbate the gulf between amateurs and professionals. From spatial audio to AI-powered avatars, emerging new technologies are raising the capabilities threshold required for commercial success, even as generative AI spawns an ever-greater flood of algorithmic creativity to compete at the market's bottom end. Meanwhile, the growing sophistication of virtual concerts and other immersive experiences will place an even greater premium on high quality digital recordings. As a result, recording costs in the

future may well increase, mirroring the steady escalation of film budgets in recent decades.[384]

Furthermore, while this study focused on recording process, it is worth remembering that recording forms only part of the music business. Crafting hit songs often involves contributions from multiple outside songwriters. Moreover, the creative team backing successful artists typically embraces a broader ensemble of contributors—photographers, videographers, graphic artists, production designers, website managers, and social media coordinators—who nurture relationships with the artist's fanbase. Such an assemblage of talented professionals does not come cheaply. Yet they collaborate to produce an esthetic product that the consuming public objectively values. Even with the latest AI advances, software can provide at best an imperfect substitute.

In short, the case for copyrighting music remains as robust as ever. If we want a steady supply of great new music to listen to, we need a mechanism to pay for it. Like it or not, copyright law remains the primary vehicle to fund mass-market cultural production. It fosters the constitutional mission of furthering artistic progress by awarding creators exclusive rights to harness the spending power of paying audiences.

Copyright skeptics protest that the current winner-take-all structure of creative markets is warped: They argue it showers undeserved riches on overhyped superstars, while relegating more diverse, authentic expression to the margins. Similar objections could be raised to the acoustic hyperrealities engineered by studio professionals: rather than fetishizing sound quality, shouldn't we appreciate a great song for its own merits and ask why isn't a good enough recording simply good enough?

Such debates need not detain us here. Suffice it to say that we live in a capitalist society, and we have a copyright system founded on market incentives. Popular music is popular, by definition, because it appeals to the most listeners. By capturing and molding the cultural zeitgeist, commercial hits embody the very progress that the copyright system is designed to reward. And for all the techno-utopian fantasies about digital democratization, professional recordings still dominate the charts.

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[384] *See* Pager & Aujla, *supra* note 22, at 1115 n.63.

This commercial reality remains true even as digital technologies have eroded the power of industry gatekeepers. The public are voting with their ears. Over a century ago, Justice Holmes cautioned in *Bleistein v. Donaldson* that "the taste of [the] public is not to be treated with contempt."[385] His words apply in today's digital age as much as ever.

Appendix

This Appendix is intended to provide additional context to illuminate our reasoning about edge cases in our dataset that we ultimately chose to classify as "Not DIY."

"Edge Cases" coded as "Not DIY" tracks

I. *"Ringers" (tracks where the artist had professional recording experience)*

- "Dark Red" by Steve Lacy (#82 on Spotify Top 200 week of September 1, 2023 and #40 on Spotify Top 200 week of February 24, 2023). Lacy was credited for all production and recording roles. Prior to the songs' release, however, Lacy was an experienced professional, having acted as producer on Grammy-winning and Grammy nominated albums for artists such as Kendrick Lamar and The Internet.[386] Although Lacy produced and recorded "Dark Red" by himself, we coded it as Not DIY because Lacy is a seasoned professional who does not represent the typical bedroom artist whom digital democratization claims contemplate.
- "Infrunami" by Steve Lacy (#122 on Spotify Top 200 week of September 1, 2023). As discussed above, Lacy was a seasoned and highly experienced professional when this track was released. So, although Lacy was the only recording professional credited on the track, we coded it as "Not DIY."
- "Not Allowed" by TV Girl (#190 on Spotify Top 200 chart for the week of September 1, 2023). We coded this track as "Not DIY" even though band members are credited in all production and recording roles. Band member

[385] Bleistein v. Donaldson Lithographing Co., 188 U.S. 239, 252 (1903).

[386] *See* Malcolm Musoni, *Steve Lacy Produced a Grammy Nominated Album, Now He's Ready to Graduate High School*, Fader, Apr. 19, 2016, https://www.thefader.com/2016/04/19/steve-lacy-the-internet-interview [https://perma.cc/S42K-4NFT]; David Pierce, *The Hot New Hip-Hop Producer Who Does Everything on His iPhone*, Wired, Apr. 14, 2017,
https://www.wired.com/2017/04/steve-lacy-iphone-producer/ [https://perma.cc/DS7L-PJYA].

Jason Wyman, who is credited on the track as co-producer as well as mixing and mastering engineer, studied audio engineering and worked as a setup assistant at Capitol Studios prior to creating the band TV Girl.[387]

- "Shut Up My Moms Calling" by Hotel Ugly (#55 on Spotify Top 200 for the week of February 24, 2023 and #76 on Spotify Top 200 chart for the week of September 1, 2023). Hotel Ugly is an American indie duo consisting of brothers Mike and Chris Fiscella. They self-released the track in 2020, and in 2022 a sped-up version went viral on TikTok, igniting the track's rise in popularity.[388] Hotel Ugly is credited as the track's producer, and no engineers or other professionals are credited. However, sources indicated that Mike Fiscella worked as a recording engineer at a studio in his hometown of Houston and was credited as recording engineer on at least one other artist's album five years before the release of "Shut Up My Moms Calling."[389]

- "Golden Hour" by JVKE (#15 on Spotify Top 200 the week of February 24, 2023 and #176 on Spotify Top 200 the week of September 1, 2023). Although the artist and his brother are the only professionals credited on the track, the artist had production credits on releases with well-known artists including Charlie Puth and Galantis prior to the release of "Golden Hour."[390]

- "Big Shot Cream Soda" by $uicideboy$ (#77 on Spotify Top 200 the week of February 24, 2023). The credited producer (Budd Dwyer) is a pseudonym of one of the group members, Scott Arceneaux Jr. Arceneaux worked as an in-house producer for Universal/Republic Records prior to founding $uicideboy$.[391]

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[387] *Interview with TV Girl*, *supra* note 214.

[388] *See Shut Up My Moms Calling*, WIKIPEDIA, https://en.wikipedia.org/wiki/Shut_Up_My_Moms_Calling [https://perma.cc/WQA9-M5RQ] (last visited Nov. 16, 2025).

[389] *See* Syrup Gang, *Planet Of The Apes: No Longer Safe*, BANDCAMP, https://syrupgang.bandcamp.com/album/planet-of-the-apes-no-longer-safe [https://perma.cc/EU7N-VV6B] (last visited Nov. 16, 2025) (web page for hip hop group Syrup Gang's 2015 album *Planet of the Apes: No Longer Safe*, crediting "Dwill & Mike Fiscella" as recording engineers).

[390] *See Jvke*, WIKIPEDIA, https://en.wikipedia.org/wiki/Jvke [https://perma.cc/7L7S-KSTL] (last visited Nov. 16, 2025).

[391] *See* Kwase Lane, *On* Sing Me A Lullaby, My Sweet Temptation*, $ucideboy$' Commitment to Sobriety is a Renewal of Spirit and Promise*, ALTERNATIVE PRESS (Aug. 1, 2022), https://www.altpress.com/suicideboys-sing-me-a-lullaby-my-sweet-temptation-interview/ [https://perma.cc/LM93-42DR].

- "Work Out" by J. Cole (#196 on Spotify Top 200 the week of February 24, 2023 and #189 on Spotify Top 200 the week of September 1, 2023). While the artist is the only recording professional credited (as producer), by time the track was released in 2011, J. Cole had already toured with Drake and produced a song for Kendrick Lamar.[392]

- "Gravity (Feat. Tyler the Creator)" by Brent Fayaz and DJ Dahi (#113 on Spotify Top 200 for February 19, 2021). DJ Dahi is one of the artists credited on the track and is also credited as the only recording professional (producer). DJ Dahi was a major producer in the hip hop and R&B world at the time this track was released, having already produced such superstars as Drake, Kendrick Lamar, Rhianna, and Big Sean.[393]

II. *Tracks that Benefitted from Extrinsic Assistance and Advantages Inconsistent with the Digital Democratization Narrative*

There were two tracks in our dataset that we considered as potential "Close Calls" but ended up coding as "Not DIY" because an outside producer was credited and substantial additional evidence suggested these tracks benefitted from extrinsic assistance and advantages inconsistent with the paradigmatic bedroom artist celebrated by the democratization narrative.

- "Hey, Mickey!" (#171 on Spotify Top 200 chart for the week of February 24, 2023) is a rap song that interpolates the famous chant, "Oh, Mickey, you're so fine, you're so fine you blow my mind, Hey Mickey!" from the 1982 Toni Basil hit "Mickey." Baby Tate self-released the track in 2016, but it achieved viral fame on TikTok in 2023 after the artist already had a 2020 hit single and a record deal with Warner Brothers.[394] Various sources credit at least one outside producer on the recording, although information about the

[392] *See J. Cole*, WIKIPEDIA, https://en.wikipedia.org/wiki/J._Cole [https://perma.cc/EX23-V8MG] (last visited Nov. 16, 2025).

[393] *See* Dewayne Gage, *DJ Dahi Breaks Down the Five-Year Process behind Kendrick Lamar's New Album*, ROLLING STONE (May 22, 2022), https://www.rollingstone.com/music/music-features/dj-dahi-breaks-down-the-five-year-process-behind-kendrick-lamars-new-album-1357269/ [https://perma.cc/7ZQ4-QBH3]; *DJ Dahi*, WIKIPEDIA, https://en.wikipedia.org/wiki/DJ_Dahi [https://perma.cc/4XWG-N94U] (last visited Nov. 16, 2025).

[394] *See* Neena Rouhani, *Chartbreaker: How Baby Tate's Transformation of a Timeless '80s Hook Became a Rap Hit—Seven Years After Its Release*, BILLBOARD (Mar. 7, 2023), https://www.yahoo.com/entertainment/chartbreaker-baby-tate-transformation-timeless-191639577.html [https://perma.cc/SR6L-UBVY].

producer(s) is sparse and inconsistent.[395] It is possible the details surrounding production of the track might be intentionally muddled by Baby Tate's team in crafting her narrative as a self-reliant artist. Moreover, the artist comes from a successful musical family: Baby Tate's mother, Dionne Faris, sang on hits for the group Arrested Development and soundtracks for successful Hollywood films, and had a recording contract with Columbia Records; Baby Tate's father is a producer and former member of the band Follow for Now, though Baby Tate claims he was largely absent from her life.[396] Given the likelihood that Baby Tate benefitted from professional collaboration on the recording, we decided to classify the song as "Not DIY." Moreover, the track charted only after Baby Tate achieved fame with another hit on a major label, and the viral success of "Hey, Mickey!" depended heavily on Baby Tate's team "invest[ing] in a TikTok campaign" and "put[ting] money into outside influencers."[397] Therefore, this is hardly a story of a digitally empowered upstart achieving stardom entirely through her own devices.

- "death bed (coffee for your head)" by Powfu (#25 on Billboard Hot 100 the week of August 22, 2020, #31 on Billboard Hot 100 the week of May 16, 2020, #63 on Spotify Top 200 week of October 2, 2020, and #89 on Spotify Top 200 week of February 19, 2020). "death bed (coffee for your head)" shares some striking similarities with "Hey, Mickey!": the track owed much of its success to a hook from a pre-existing song, it benefitted from the involvement of a major record label, it enjoyed TikTok virality, and the artist had famous musician parentage. Powfu had "already spent the better part of two years amassing a devoted following on SoundCloud" before he

[395] *See id.* ("After receiving the beat from a producer who often sent sounds her way, Tate recorded Basil's famous 'Mickey' chant atop the wonky production on a Snowball USB microphone, and it stuck."); Baby Tate, *Hey, Mickey! (prod. by TayDay)*, SOUNDCLOUD (2016), https://soundcloud.com/yungbabytate/hey-mickey-prod-by-ttd [https://perma.cc/RCY8-8WP2] (crediting a producer named "TayDay" and stating, "Yung Baby Tate teams up with TTD to give you 'Hey, Mickey!'," although it is unclear who TayDay and TTD are and whether they are the same person); *see also Hey, Mickey!*, GENIUS, https://genius.com/Baby-tate-hey-mickey-lyrics [https://perma.cc/GZX7-P5Y2] (last visited Nov. 16, 2025) (crediting "Tayday" as producer of the track).

[396] *See* Manny King John, *Yung Baby Tate: 'I Don't Send Hate Back to the Haters'*, GRUNGECAKE (Nov. 22, 2019), https://grungecake.com/yung-baby-tate-interview/articles/43844/2/ [https://perma.cc/KT5C-T3LE].

[397] *See* Rouhani, *supra* note 394.

uploaded "death bed" to SoundCloud in 2019.[398] Before "death bed" charted and was even released to streaming services, Powfu signed to Columbia Records, which cleared the Beeabedoobee sample and promoted the track.[399] It is possible—if not likely—that Columbia used engineers to enhance and master the track pre-release but left them uncredited to preserve the track's indie credibility. Following its major label release, "death bed" became a TikTok viral sensation. *Id.* "death bed" credits just two people involved in the recording: the artist and a producer named "Otterpop." Otterpop is a beatmaker the *New York Times* described as "a little-known producer" at the time artist Powfu discovered and used Otterpop's beat.[400] It is unclear how much experience Otterpop had at the time he created the beat used in "death bed" (Otterpop's earliest production credit on Genius.com is roughly contemporaneous with Powfu's uploading of "death bed" to SoundCloud).[401] Otterpop's beat (and thus Powfu's entire track) relies heavily on a long sample from "Coffee," a 2017 track by Beabadoobee, "a British singer who'd already had a bit of success making sweet indie pop."[402] Indeed, the use of the sample is so central to "death bed" that Beabadoobee was ultimately credited as a featured artist on Powfu's track. Beabadoobee's "Coffee" itself is styled as a bedroom production by teenage artist/producer Oscar Lange, who claims to have cut his teeth as a neophyte producer working with Beabadoobee.[403]

While one could argue that "death bed" appears to be a pastiche of stacked DIY recordings—a bedroom production by Oscar Lang sampled

[398] John Norris, *How Marriage and Religion Helped Melancholy Rapper Powfu Find Joy*, Billboard, Oct. 8, 2021, https://www.billboard.com/music/music-news/powfu-interview-married-tell-me-your-feelings-9642450/ [https://perma.cc/J7VR-F4E7].

[399] *See* Jesse Kinos-Goodin, *How a Song Goes Viral: Powfu on 'Death Bed' and Its Steady Rise to the Top*, CBC.ca (June 11, 2020, at 15:09 ET), https://www.cbc.ca/music/how-a-song-goes-viral-powfu-on-death-bed-and-its-steady-rise-to-the-top-1.5607847 [https://perma.cc/G6ZP-NFC2].

[400] *See* Jon Caramanica, *The Universal Loneliness of Powfu*, N.Y. Times (Aug. 5, 2020), https://www.nytimes.com/2020/08/05/arts/music/powfu-poems-of-the-past-review.html [https://perma.cc/KL66-A5NR].

[401] *See Otterpop*, Genius, https://genius.com/artists/Otterpop [https://perma.cc/USV6-4LS3] (last visited Oct. 22, 2025).

[402] Caramanica, *supra* note 400.

[403] *See* Maria Bocci, *Oscar Lang Is the Nonchalant Guitar Nerd about to Conduct a Quiet Coup of Bedroom Pop*, Line of Best Fit (Dec. 17, 2019, at 12:04 ET), https://www.thelineofbestfit.com/features/interviews/on-the-rise-oscar-lang [https://perma.cc/N8CD-E84K].

by possible bedroom producer Otterpop and used by bedroom artist Powfu—we think the involvement of two producers (albeit of uncertain experience) plus a major label raise significant doubts about the track's DIY purity. Moreover, like Baby Tate, Powfu benefitted from having a rock star parent, who Powfu claimed "helped me the whole way."[404] Powfu's father, Dave Faber, was founder and lead vocalist of the pop punk band Faber Drive that had five top 40 singles and a top ten hit on the Canadian Hot 100 and won a Juno (Canada's premier musical award).[405] According to Powfu, his father was closely involved in his musical development and career and became his manager.[406] Whether Powfu's rock star father was directly involved in the recording of "death bed," he clearly provided Powfu with formidable advantages in music and the industry that are unavailable to the paradigmatic DIY artist at the core of the digital democratization narrative.

III. *Tracks Based on Beats by an Experienced Producer or Beat Maker*

As noted above, beat makers are often credited as producers.[407] In some cases (such as Star Shopping by Lil Peep), the beat maker credited as producer lacked substantial experience, and we coded these as "Likely DIY."[408] In other cases, where the beat maker already had significant professional credits, we coded the tracks as "Not DIY." Our justification for excluding these tracks follows a logic analogous to the ringers: namely, that professional beat makers bring a level of sophistication to the recording process beyond the paradigmatic contours of the democratization narrative.

There were two such tracks in our dataset, both by artist dv4d:

- "Romantic Homicide" (#21 on Spotify Top 200 for the week of February 24, 2023, and # 85 on Spotify Top 200 for the week of September 1, 2023).

[404] Andrea Dresdale, *Powfu on How His Rock Star Dad Put Him on the Path to Success: 'He Helped Me the Whole Way,'* 97.9WRMF (2020), https://www.wrmf.com/powfu-on-how-his-rock-star-dad-put-him-on-the-path-to-success-he-helped-me-the-whole-way/ [https://perma.cc/3ZP7-AXCS].

[405] *Id.*

[406] *See* Kinos-Goodin, *supra* note 399.

[407] *See supra* notes 87–88 and accompanying text.

[408] *See supra* note 119.

Dv4d was by most popular press accounts a "bedroom" artist.[409] However, the producer credited on the track, Dan Darmawan, is a beat maker who appears to have been selling his beats to artists via the beat marketplace BeatStars for at least two years before the release of "Romantic Homicide."[410] One of his production credits predating "Romantic Homicide" is for the track "Casi Amor De Verano" by popular Chilean artist Young Cister, released by Sony Music.[411] Because Darmawan sold beats professionally and had at least one major label credit at the time "Romantic Homicide" was released, we coded "Romantic Homicide" as "Not DIY."

- "Here with Me" (#28 on Spotify Top 200 for the week of February 24, 2023). Beat maker Dan Darmawan was credited as producer and sole recording professional on this track, as well. For reasons discussed above regarding "Romantic Homicide," we coded this track as "Not DIY."

Tracks for Which Insufficient Information Precluded a Determination

There was one track in our dataset about which we could not find sufficient information to make any conclusions about the level of professional involvement in the recording: "be happy" by Chillhop Bandits (#8 on Rolling Stone Trending 25 for the week of October 2, 2020). We were unable to find a track titled "be happy" by an artist named Chillhop Bandits on Apple Music, YouTube, or in the Jaxsta database. It is possible that the Trending 25 chart misattributed a track by Canadian lo-fi bedroom pop rapper 347aidan, who released a track titled "be happy" in March 2020.[412] However, we were unable to find any sources connecting 347aidan to "Chillhop Bandits" and thus could not confirm these were the same track, and we had no evidence otherwise indicating a misattribution. Accordingly, we left "be

[409] *See, e.g.*, Cydney Lee, *How 'Fortnite' Led to 18-Year-Old d4vd Quietly Dominating Alternative Music*, Billboard (May 15, 2023), https://www.billboard.com/music/features/d4vd-romantic-homicide-21-under-21-list-fortnite-interview-1235326094/ [https://perma.cc/8EJA-U49G].

[410] *See Dan Darmawan*, YouTube, https://www.youtube.com/@DanDarmawan [https://perma.cc/Z6ZT-QPW4] (last visited Oct. 22, 2025) (posting beats marked as "sold" two years prior to the release of "Romantic Homicide").

[411] *See Dan Darmawan*, Genius, https://genius.com/artists/Dan-darmawan [https://perma.cc/XQ7H-3WP8] (last visited Nov. 16, 2025).

[412] *See* 347aidan, *Be Happy*, Genius, https://genius.com/347aidan-be-happy-lyrics (last visited Dec. 19, 2025).

happy" by Chillhop Bandits uncategorized and we disqualified the track from our dataset.

Even if the "Chillhop Bandits" entry on the Rolling Stone Trending 25 chart is a misattribution of 347aidan's "be happy," the 347aidan track's DIY status is indeterminate. 347aidan's "be happy" credits only one individual—the artist as songwriter—and credits no one under the production and engineering category, including no credits naming the artist themselves in a production or engineering role. Because no one is officially credited in a production or engineering role and we found no external sources crediting the artist in those roles, the DIY status of 347aidan's "be happy" is ambiguous. By contrast, the Plausibly DIY recordings we discuss above all credit someone in a production or engineering role, even if that individual is the artist, with the exception of Grupo Frontera's "No Se Va," for which we found external corroboration of the track's DIY origins.[413]

[413] *See supra* note 123 and accompanying text.