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Artificial Intelligence and Music Production: The Future That Has Arrived[1]

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Abstract

This paper explores the impact and integration of artificial intelligence in music production (AIMP). It discusses how these technologies affect the creative, economic, and professional processes within the music industry. It also highlights the resurgence of retro elements and their digital implementation as strategies to meet the demands of a specific audience. The discussion takes a theoretical and analytical approach, based on the observation of current trends in music production and the analysis of AIMP applications in the creative field. Throughout the paper, specific tools are illustrated, such as DeepMind, Landr and Synth Assist, which are used in different stages of audio production, such as composition, mastering and their industrial and aesthetic implications. The conclusions indicate that although AIMP offers extensive possibilities for audio creation and production, its current role is auxiliary; that is, human interaction is required to achieve the final product. On an industrial level, it is observed that major record labels are investing in specialized AIMP laboratories, steering towards automation that could reshape roles in the music industry. However, it is noted that IAPM does not generate, for the time being, autonomous musical proposals. The role of the producer will be transformed into one of specialized consulting rather than direct creation.

1 This essay is based on the author's participation in the IX Musical Research Symposium. *Dreaming of Puerto Rico: Music, Tourism, and Sustainability*, held from October 16 to 18, 2024, at the Conservatory of Music of Puerto Rico.

Keywords: Artificial Intelligence, Music Production, Vintage Sound, Record Industry, Automation.

Introduction[2]

In recent years there has been a resurgence of the vintage or retro sound, as seen in record productions that emulate, through processed reverb, the audio of recordings from the 1980s. This phenomenon is particularly prominent in the discography of the K-pop and J-pop worlds. In some cases, words such as "nostalgia" are used to describe this characteristic, as well as "contemporary narrative" or "alternative", a term that is often used indiscriminately. Even some of the album covers from these artists evoke the design and colors of 1980s records.[3]

In this context, based on research conducted by Loreto Amoretti & Pérez Valero, it is proposed that the music industry is committed to the development of Artificial Intelligence in Music Production (AIMP) and the recreation of technology as an emotional trigger for the listener.[4] For acoustic, technical, and historical reasons, digitally emulating the sound of the 1980s is simple. From the onset of recording technology, the aim was to capture audio that closely resembled the real source; thus, the expectation was that the phonogram fixed on the sound medium would be natural. The recorded phonogram on the sound medium is perceived as 'natural' in the sense that it conveys a sonic realism, simulating the presence of the musician within the listener's space. This effect—often described in terms of fidelity or acoustic verisimilitude—suggests that the recorded sound approximates the spatial and timbral

2 This work is part of the project "Musicology and Music Production" (VPIA-2025-08-PI). Research Group: "S/Z Music Production and Research in Arts (VPIA – 2021 – GI - 10). Universidad de las Artes, Ecuador.

3 Roland Kelts, *Japanamerica: How Japanese Pop Culture Has Invaded the U.S.* (Palgrave MacMillan, 2006).

4 Marelis Loreto Amoretti & Luis Pérez-Valero, "Artificial Intelligence for Music Production (AIMP): Pedagogy and Teaching through Innovative Technological Strategies," *Yuyay: Estrategias, metodologías & didácticas educativas* 3, no.1 (2024): 66-87. https://doi.org/10.59343/yuyay.v3i1.59

characteristics of live performance, fostering an immersive auditory experience.[5] This requirement has carried through to the present day in audio production. Specifically, in the commercial post-production of the 1980s, natural sound was reworked within the recording studio through reverb manipulation, use of compressors, or wave modification.[6]

In the transition to the digital era, when analog sound was converted into electronically processed codes, acoustic data transfer occurred; in other words, the binary code now used for creating new musical proposals was organically and naturally infused with that retro or vintage sound. A perfect example of this can be found in programs like Logic or Ableton, which include electronic sounds with impressive acoustic fidelity. Analog recordings transformed into digital frequencies. The analog recording has been transformed into digital frequencies. When new digital recordings are generated, the technology turns to a vast database, to an acoustic sound memory available in digital format.[7]

What does all this have to do with AIMP? Essentially, AI is a propositional language model that achieved notable success starting in 2022. For many experts, that year marked the advent of artificial intelligence.[8] At that time, other prototypes such as Gemini or ChatGPT, systems for generating answers from a simply structured language, became popular. These models were designed to connect different ideas and moments, with easy access that yields

5 Pierre Schaeffer's distinction between the "sound object" and its perceived source to problematize the idea of "naturalness." The natural here is mediated through technological apparatuses, including microphones, EQs, and reverbs, that simulate spatiality. Pierre Schaeffer, *Treatise on Musical Objects: An Essay across Disciplines* (University California Press, 2017).

6 Andrew Bourbon & Simon Zagorski-Thomas, *The Bloomsbury Handbook of Music Production* (Bloomsbury, 2020).

7 Mark Cousins & Russ Hepworth-Sawyer, *Logic Pro 9. Audio and Music Production* (Routledge, 2010). https://doi.org/10.4324/9780240521947; Paul Théberge, "Transitions: The history of recording technology from 1970 to the present," *The Bloomsbury Handbook of Music Production* (Bloomsbury, 2020: 69-87).

8 Yoesoep Rachmad, "The Role of Artificial Intelligence and Human Collaboration in Management 5.0: Global Perspective," *The Academic Professor Board Protocol* (United Nations, 2022); Martin Clancy, ed., *Artificial Intelligence and Music Ecosystem* (Focal Press, 2022).

effective results when an appropriate vocabulary is used. However, their proficiency lies in creating prompts, which are the instructions given to AI to generate a result.

This has sparked a series of relevant academic debates summarized in three points:

1. Pedagogical use of artificial intelligence: This debate focuses on implementing AI in school teaching, as an aid in research, data review, and statistical analysis.[9]
2. Disappearance of professions: This explores the possibility that various professions, trades, and jobs may disappear due to artificial intelligence.[10]
3. Exploitation of economic opportunities: This third debate, which has less bibliography, deals with the exploitation of all economic alternatives derived from technology applied in productions.[11]

This text focuses on the impact and assimilation of AIMP. We aim to explain how these technologies have affected creativity, economic aspects, and professional dynamics within the music industry. It also highlights the emergence of eclectic, retro trends and their digital implementation to satisfy a market of audiences nostalgic for an era they did not live through. The discussion takes a theoretical and analytical approach, based on observing current trends in music production and analyzing AI applications in the creative field. Throughout the paper, tools that have been used at different stages of music production are illustrated, from composition to mastering, alongside their industrial and artistic implications.

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9 Emilio Ros-Fábregas, "Musicology in the Age of Artificial Intelligence (AI)," *Anuario Musical* (2023), 78: 7-12. https://doi.org/10.3989/anuariomusical.2023.78.01

10 Georgina Born, Jeremy Morris, Fernando Díaz, and Ashton Anderson, *Artificial Intelligence, Music Recommendation, and the Curation of Culture* (University of Toronto, 2021). Here we propose examples: could the astronaut's job disappear? As we know, a journey from Earth to Mars requires considerable energy. Perhaps artificial intelligence could save humans a vast amount of resources to study Mars. The same applies to the music producer, whose profession may be at risk. However, I personally do not believe so; instead, it is an occupation that will need to be redefined.

11 Madeleine de Cook Buning, "Artificial Intelligence and the Creative Industry: New Challenges for the EU Paradigm for Art and Technology," in *Research Handbook on the Law of Artificial Intelligence*, eds. Woodrow Barfield & Ugo Pagallo (Edward Elgar Publishing, 2018), 511-535.

Productions, Corporations, and Artificial Intelligence

The commercial exploitation of AI is relatively recent. Especially since 2022 it has become popular as a tool available to professionals, academics and students. However, the music industry had been developing AI-dedicated laboratories for years. The big three corporations: Sony Music, Warner Music Group and Universal Music, have invested large sums in human and technical resources to generate AI-enabled products. The result has been commercialized through cell phone applications adapted to make music production intuitive, but with quality. This means that recordings have been created from scratch to final results. The entire music production pipeline is sifted through the IAPMs until the phonogram is obtained.

As of 2018, major record labels have acknowledged having AI development laboratories. Collaborative work between audio engineers, IT technicians, AI specialists, and computer engineers has expanded. The goal has been to develop AIMP software. If major corporations have invested in it, it is because they recognize the potential of AI to generate economic benefits in the short term.[12] This raises questions about how music and sound will be created and sound in the future, tying into our discussion on the use of vintage sound.

12 Rujing Huang, Bob Sturm, Andre Holzapfel, "De-Centering the West: East Asian Philosophies and the Ethics of Applying Artificial Intelligence to Music," *Proc. of the 22nd Int. Society for Music Information Retrieval Conf.* (2021): 301-309.

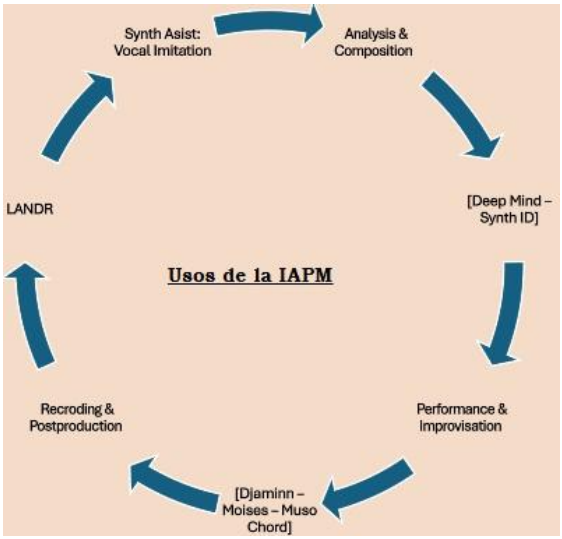

Figure 1: Workflow based on AIMP.[13]

The uses of AIMP span a broad spectrum involving various phases, such as creating a melody, arrangements, and even designing album covers and marketing strategies. As shown in Figure 1, different AI programs focus on music composition and analysis. Software such as DeepMind and Synth ID generate songs from simple parameters. When used as an analytical tool, they can decode and identify other AI-generated pieces. The starting point is composition; once it is created, it can be reworked through assisted improvisation. This produces a performance executed using programs like Djaminn, Moses, or Muso Chord.

Thus, AI's scope extends to other stages of music, such as recording, audio generation, editing, mixing, and mastering. One software that has taken hold in recent years is Landr, which performs automatic and efficient mastering. The mastering stage, which could previously take several days, is now achieved with high-quality standards in just a few minutes. Time optimization and satisfactory results at the lowest cost, this is part of IAPM's scope. Mastering is a crucial moment in music production; it stabilizes frequencies and adjusts

13 Author's own elaboration.

recordings made at different times, creating homogeneity and cohesion in the final product, especially when working with album or playlist formats.

The emergence of the IAPM places the producers' profession in check. Hiring the services of a specialized mastering engineer, with a professional studio set up for that purpose, was a possibility beyond the reach of amateur artists. Because of its costs and refined degree of specialization, the process was reserved for large companies. However, since the advent of Landr, music production students at universities worldwide now have access to this software and can achieve professional-level mixes and mastering for their final projects. Not only that, but even professional producers also associated with major record labels use it. Landr, along with other tools like DeepMind, Synth ID, and Jam, has been developed by the music industry oligopoly. These applications were released as free access prototypes to identify focus groups and collect data on how and in what ways users interact with AIMP. This is how the industry analyzes market behavior and continuously improves the software. It avoids paying users for their interaction and obtains revealing data on consumer preference.[14]

This rapid and sustained development of AIMP also paves the way for music learning. For example, Synth Assist Vocal Imitation is an AI in its testing phase. No explanation is necessary; just singing or whistling a melody allows the program to record and perfect what it has heard. How does it work? Imagine a music enthusiast who wants to create but cannot read sheet music or play instruments. With this software, the new composer hums a melody, and the program suggests a type of composition based on user preferences. Whether it's jazz, blues, reggaeton, or a symphonic piece, once the composition is generated, it can go through the

14 Jonathan Sterne & Elena Razlogova, "Machine Learning in Context, or Learning from LANDR: Artificial Intelligence and the Platformization of Music Mastering," *Social Media + Society* 5, no. 2. https://doi.org/10.1177/2056305119847525; Nick Seaver, *Computing Taste. Algorithms and the Makers of Music Recommendation* (University of Chicago Press, 2022).

music production line: touches of improvisation and performance to add humanity, then editing, mixing, and mastering using tools like Landr.[15] This redefines AIMP's potential. We are facing the possibility of creating music at a professional level, in a short time thanks to the IAPM.

Nostalgia and the Future as an Algorithmic Strategy

Technological advancement may seem recent, but it is not. Artificial intelligence has been present in music since the mid-20th century. Although the advent of artificial intelligence in music production may appear as a recent phenomenon, it must be situated within a much longer trajectory of technological mediation in the arts. Following Jonathan Sterne's work on the audiovisual imaginary, we understand 'technology' not merely as advanced machinery but as a cultural and epistemic system, encompassing writing, notation, instruments, and even conceptual frameworks.[16] As Derrida reminds us in *Writing and Difference*, writing is already a form of technological exteriorization of memory and thought—thus, musical notation itself can be theorized as a pre-digital form of artificial intelligence, structuring and transmitting abstract sonic information across time and space.[17] Moreover, Walter Benjamin's *The Work of Art in the Age of Mechanical Reproduction* illuminates how each stage of technological mediation alters the ontology of art—introducing questions of authenticity, aura, and reproducibility.[18] AI-based music production must be read within this broader genealogy of cultural technologies that reconfigure the means of musical creation, distribution, and reception.[19]

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15 Mark Cartwright & Bryan Pardo, "SynthAssist: An Audio Synthesizer Programmed with Vocal Imitation," *MM 14* (2014). http://dx.doi.org/10.1145/2647868.2654880

16 Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Duke University Press, 2003).

17 Jacques Derrida, *Writing and Difference* (University of Chicago Press, 1978).

18 Walter Benjamin, *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media* (Harvard University Press, 2008).

19 Friedrich Kittler's idea that 'media determine our situation'—AI is not a rupture, but a continuation of a long process of mediation. Friedreich Kittler, *Literature, Media, Information Systems* (New York: Taylor & Francis, 2013).

In 1949, Robert Musa founded what we now call "Digital Humanities." Since then, innovations such as synthesis in 1953 and Open Music in 1955 have been introduced, with the latter being key for assisted music composition. In 1975 the first automated audio systems were introduced, where engineers generated an audio mix with computers under certain standards. Fifty years have passed since the first automatic audio mixing formats appeared. At that time, engineers would load the channels and request a computer-generated mix based on certain parameters.[20] By 1980, studies on audio, synthesis and mixing with artificial intelligence were systematized. But, following the change from the vinyl record format to the digital format, there was little interest from industry and academics to find out the results between the interaction of AI, audio and the user.[21]

With ChatGPT's consolidation in the market, the dynamics of interaction with AI became normalized. In the music industry, the first AI-produced albums appeared in the international market around 2018, although it might have happened earlier. While the first widely recognized AI-produced albums entered the international market around 2018—such as works generated by OpenAI's MuseNet or Sony CSL's Flow Machines—there is evidence that precedents date back further. Experiments by David Cope with Experiments in Musical Intelligence (EMI) in the 1990s, as well as algorithmic compositions by Iannis Xenakis, Lejaren Hiller, and others, already integrated rule-based systems, stochastic processes, and early machine learning logics to generate music. The distinction between 'AI' and other algorithmic or generative methods becomes blurred, especially given that machine learning models were

20 Pablo Cetta, *Fundamentals of Computer-Assisted Musical Composition in the OpenMusic Programming Environment* (Universidad Católica Argentina, 2018).

21 Emmanuel Deruty, Maarten Grachten, Stefan Lattner, Javier Nistal, Cyrian Aouameur, "On the Development and Practice of AI Technology for Contemporary Popular Music Production," *Transactions of the International Society for Music Information Retrieval* 5, no. 1 (2022): 35-49. https://transactions.ismir.net/articles/10.5334/tismir.100

often in development prior to their commercial or public application. Therefore, the commercial emergence of AI in 2018 reflects more of a culmination than an origin. Notable examples include the albums I AM AI by Taryn Southern and Hello World by Skygge.[22] In 2019, another AI-produced album, Proto by Holly Herndon,[23] was released. These recordings explore the advantages of AIMP, yet a sense of nostalgia is evident in their sonic aesthetics.

Nostalgia, far from being a purely individual sentiment, is a historically and ideologically conditioned affect. Bauman describes the contemporary yearning for an idealized past as a collective response to the perceived failures of neoliberal modernity. Rather than utopian projection, society turns backward toward an imagined, stable past.[24] Similarly, Berardi suggests that this turn to nostalgia arises from a 'slow cancellation of the future', a disaffection with contemporary temporality and the exhaustion of utopian imagination under digital capitalism.[25]

Traverso provides a political reading of nostalgia as melancholic attachment to lost revolutionary futures. In this context, the use of retro sound aesthetics in AI-produced music can be interpreted as symptomatic of a larger cultural mood—what Mark Fisher might term 'hauntology'—where the past reasserts itself through mediated repetition, precisely because the future no longer seems narratively viable.[26] Thus, nostalgia in music is not simply a stylistic choice; it is an affective and ideological response to the temporal dislocations of late capitalism, mediated through technological simulation.

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22 Taryn Southern, *I AM AI* (Independent, 2018); Skygge, *Hello World* (Flow Records, 2018).

23 Holly Herndon, *Proto* (4AD, 2019).

24 Zygmunt Bauman, *Retrotopia* (Madrid: Paidós, 2022).

25 Franco Berardi, *Ironische Ethik(documenta (13): 100 Notes – 100 Thoughts, 100 Notizen – 100 Gedanken # 27* (Hatje Cantz Verlag GmbH, 2011).

26 Enzo Traverso, *Left-Wing Melancholia. Marxism, History, and Memory* (Columbia University Press, 2016); Mark Fisher, *Ghosts of My Life: Writings on Depression, Hauntology and Lost Futures* (Zero Books, 2014).

The use of synthesizers and samples that mimic the character of analog sounds is combined with textures that evoke a warm sound. The AI algorithms draw on acoustic data from the grainy sound of tape recordings. For instance, in Hello World, algorithms have generated harmonies and timbres based on genres like funk and soul. Although the sound design appears futuristic, it serves as a strategy to evoke a reimagined past. The processing and vocal ensemble emulate the human warmth in Proto, resulting in a blend of human and artificial sonic elements. Producers attempt to reproduce a sonic memory that feels like a shared, multisensory experience.

These recordings gained media attention for being produced with AIMP. However, the most famous dispute occurred in 2023 with the song "Heart on My Sleeve" by Drake and The Weekend.[27] In this case, there was talk of a ghost songwriter, a "pirate" producer who was actually an AI. Media coverage sparked debate about the ethics of using a ghost composer, but the discussion about the application of AIMP technology was largely overlooked.

So far, all AI-produced recordings reflect a vintage or retro sound that existed previously. AIMP is a propositional model; that is, without human intervention, AI does not create the final product. It's fascinating to see eclectic examples like Hello World, where bossa nova, funk, and pop are combined. All tracks are composed by an AI using electronic elements, although the mixing process in these recordings is not yet automated. When listeners hear these recordings, they perceive the sonic imprint of a past era. This aspect is crucial, especially for younger audiences who identify with the sound of a time they did not live through.

This type of music, which seems innovative, indicates how the music industry sets the direction for future recordings and their commercialization. Initially, it was believed that music

27 Drake & The Weeknd, "Heart on My Sleeve" (Ghostwriter977, 2023).

produced with AI would sound cybernetic; nothing could be further from the truth. AIMP aims for a natural sound by using elements and aesthetics that have been developed in the past and legitimized by audiences. From a musicological perspective, this phenomenon has been studied through concepts like cultural nostalgia or retromania, terms describing how new generations recover and reinterpret sounds, aesthetics, and forms of consumption from past decades. Generally, this represents an attempt to connect with what is perceived as a lost style. In his analysis of retro culture, Simon Reynolds suggests that this trend is a response to accelerated technological innovation, generating a longing for familiar sounds, even if they are not part of the listeners' lived memory.[28]

From the fields of psychology and psychiatry, this phenomenon has been studied as a reminiscent effect and anticipatory nostalgia. Nostalgia is a yearning for the past, while the reminiscent effect suggests that younger audiences have an emotional connection to eras preceding their birth. Evocation and representation occur through aesthetic and sonic elements that trigger an emotional response. This relates to nostalgic imagination, where listeners form an idealized link with a specific period. Neuropsychology has studied how certain sonic patterns (analog tapes or 1980s synthesizers) activate brain areas associated with affective memory, provoking an emotional response that leads listeners to identify with these "past" sounds.

While neuropsychological studies indicate that certain auditory stimuli—such as analog tape hiss or vintage synthesizer textures—activate regions of the brain associated with affective memory, this affective mechanism must also be understood through broader cultural theory.

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28 Simon Reynolds, *Retromania: Pop Culture's Addiction to Its Own Past* (Macmillan, 2011); Mark Fisher, *Ghosts of My Life: Writings on Depression, Hauntology and Lost Futures* (Zero Classics, 2014); Fred Davis, "From yearning for yesterday: A sociology of nostalgia," in *The Collective Memory Reader*, eds. Jeffrey K. Olick, Vered Vinitzky-Seroussi & Daniel Levy (OUP, 2011: 446-451).

Freud's notion of melancholia posits a psychic attachment to lost objects, which resonates with how music listeners might form emotional bonds to sonically reconstructed pasts.[29]

Furthermore, Boym's distinction between 'restorative' and 'reflective' nostalgia offers a helpful lens: the former seeks to recreate an idealized past, while the latter acknowledges its loss and mediates it through art. AI-generated nostalgic soundscapes might function reflectively, generating affective atmospheres that simulate a past listeners know is irretrievable, but desire, nonetheless.[30] In this sense, nostalgia in AI music production is not a retrograde act, but an aesthetic articulation of melancholia, dramatizing the disjuncture between past sonic worlds and the algorithmic present. All these aspects summarize the current use of AIMP. This knowledge and these strategies are known and encouraged by the recording industry.[31]

Today, we have reached a point where both the artist and the recording are created with AI. In processes that seem automated, like mixing, human interaction is used to define audiences and control the genre's aesthetics being produced. AIMP assists sound engineers in data processing and market analysis, enabling adjustments in mastering based on streaming platform algorithms. What will happen to the role of the music producer? With the consolidation of AIMP, the workflow in music production is changing. The traditional production line: artist, recording, editing, mixing and mastering; is compacted, saving time, money and, consequently, reducing the number of agents involved in the production of the phonogram.

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29 Sigmund Freud, *The Complete Psychological Works of Sigmund Freud*, vol. 14 (London: Random House, 2001).

30 Svetlana Boym, Common Places. Mythologies of Everyday Life in Russia (Harvard University Press, 1994).

31 David Huron, *Sweet Anticipation: Music and the Psychology of Expectation* (Massachusetts Institute of Technology, 2006); Elizabeth Hellmuth Margulis, *On Repeat: How Music Plays the Mind* (Oxford University Press, 2013); Ryan Lizardi, "The Future of Nostalgia Is Inevitable: Reflections on Mediated Nostalgia," *Nostalgia Now* (Routledge, 2020: 147-161).

Conclusions

New horizons, challenges, and questions emerge with AIMP. It is possible to create content with minimal time and budget; something that has not gone unnoticed by the music industry. However, achieving this requires significant investment in high-end technology, equipment, software, and specialized labor. Moreover, the advancement of this technology is swift. While you are reading this text, software tools have already evolved, merged, or transformed into something different. Another notable aspect is AIMP's ability to synthesize songs, mix, and rework pieces, referred to as mash-ups, collages, or new musical proposals. These, which are essentially the result of combining different songs, constitute new compositions. Consequently, non-biological or virtual artists have emerged, such as Hatsune Miku, a Japanese virtual artist. Although she does not physically exist, Miku is legally recognized as an artist. In the short term, a trend that could arise is the virtual resurrection of deceased artists: using their voices and, in some cases, holograms. For example, Frank Sinatra's heirs could generate new revenue by using the singer's digitized voice to create new songs from existing material. The music producer will become a specialist, a consultant, someone who has listened to and knows a lot about music and production but whose role as a creator will not be essential. AIMP will generate the final product for the music industry.

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