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DIGITAL REVOLUTION IN MUSIC INDUSTRY

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Abstract

The digital revolution in the music industry describes the changes by the developments in digital technology in the production, distribution and consumption of music. This research paper explores the impact of technology on music industry. The technological transformation of the digital era such as Digital audio workstations (DAWs), followed by Artificial Intelligence (AI), Blockchain, Non-Fungible Tokens (NFTs), Augmented Reality (AR) and Virtual Reality (VR) in music industry has been discussed in this paper. Digital audio workstations (DAWs) have balanced music production, making it accessible and affordable for musicians to compose, record, and experiment with sound. There have been technological changes which have influenced people listening to music, shifting from physical formats to digital platforms. This paper highlights the role of AI in how it has influenced in music productions and recommendation systems. The AR and VR technologies has pushed the live performances and music education by interactive experiences. The Blockchain and NFTs provide new approaches in reshaping music experiences. This research paper highlights that technology is not only a tool that has changed the systems of creating and distributing music; but also, has expanded the way we create and interact with music, therefore contributing to the development of a more diverse and creative music system.

Methodology: *The study employs a qualitative methodology to analyses the digital revolution in the music industry. The data for this paper is sourced from secondary sources like webpages, academic journals, and research papers.*

Keywords: *Digital Audio Workstation, Artificial Intelligence, Blockchain, NFTs, Augmented Reality, Technology*

INTRODUCTION

Music is a unique form of human expression and creativity that can evoke strong emotional responses and connect people globally. The gradual evolutionary process of music is really a key to the whole range of musical production. With the developments in new technologies, the innovations in music have been continuously changing. Digital music platforms and software has transformed how we listen to and create music, making it easier than before and allowing artists to share their creations with the world. The beginning of recorded music industry was marked by the invention of Phonograph, the first device capable of recording and playing back sound by Thomas Edison in 1877.[1] Music production, distribution, and consumption have experienced significant changes in this era of fast technological advancements. These development marks a turning point in the music industry's history and has major implications for musicians as well as music lovers. Music has become more accessible, enabling independent artists to connect with audiences around the world. In this paper, we will take a look at the music industry's evolution into the digital age. We will discuss the impact of Digital Audio Workstations, streaming services, Artificial Intelligence, technologies like Blockchain and NFTs, Augmented and Virtual Reality in music production.

DEVELOPMENT OF TECHNOLOGIES IN MUSIC INDUSTRY

Music has always been shaped by technology, from the very beginning. During pre-digital era, the mechanical devices like Phonograph, Spool, Magnetic Tape, Vinyl Records, Cassette Tapes, CDs were used in recording, distributing and consuming music. Electronic music began to gain popularity in the beginning of the twentieth century. At the present stage of the development of electronic music, various technologies have burst out new vitality with the development of computer science and technology and the enhancement of various hardware function modules.[2] The emergence of digital audio workstations (DAWs) has opened a great possibilities of music production. Digital recording and editing replaced analog, offering improved sound quality and flexibility. Professionals, semi-professionals and amateurs uses DAWs to produce their music works. DAWs are used for recording various sounds, place tracks, rearrange, edit the tracks, add effects for enhancing the recorded sound, mixing and mastering that complete a series of tasks required for music production.

The invention of software plugins and sample-based production has expanded the possibilities for artists, encouraging innovation and creativity. The software Pro Tools became industry's standard workstation. Some of the other software are Logic Pro, Cubase, Ableton Live, Nuendo. DAWs made professional recording accessible to everyone.[3] Anyone with an internet connection may create music with the help of platforms like BandLab, GarageBand which provide free web-based DAWs. It allows one to collaborate with other musicians by sharing the project files.

The internet has made easier for music distribution and promotion. File-sharing platforms and streaming services like Spotify, Amazon Music, Apple Music, YouTube Music and many have made music readily available to a global audience. The streaming services provide artists direct access to the global audience. The music distribution companies help musicians by ensuring their music available on all major platforms which seems to be crucial for an artist's growth in music industry.

FUTURE TECHNOLOGIES

Looking towards the future, technology will continue to influence music. Artificial Intelligence, Virtual Reality, Augmented Reality and new forms of live performance promise to create new possibilities.

ARTIFICIAL INTELLIGENCE (AI)

Music is changing and so are the devices and medium. Artificial Intelligence has revolutionized many industries including music industry. The number of people using AI is steadily increasing for a long time. Artificial Intelligence refers to the study of how to make computers do tasks that are associated with human intelligence.[4]

In the present times, AI is being used to create or enhance music. AI has a significant role in music industry. AI generated music is an emerging technology created by artificial intelligence-based algorithms. These algorithms replicate the tempo, pitch and range found in existing music tracks, leading to the creation of entirely a new version. The first step is to input prompts specifying certain emotions or genres and these prompts guide AI algorithms in creating a musical composition. It collects data from various music streaming sites. Then the collected data are analysed and is used to train a supervised algorithm, incorporating elements such as existing chapters, chords, vocals, and melodies. The AI platform recreates the sound of different musical instruments.[5]

Artificial Intelligence is rapidly changing the music industry, with the developments of new applications. OpenAI's MuseNet and Google's Magenta are AI platforms. It even assists new and seasoned musicians in creating their own music. It also can help correct vocal pitch and allow engineers to mix and master recording much more quickly. LANDR Audio, a cloud-based AI mastering tool which helps to mix and master recordings using advanced algorithms and techniques to analyse and enhance its audio quality. Mastering a full song may take multiple hours or even days. In this scenario, AI based mastering tools helps in mastering an audio work more quickly with the help of enhanced plug-in, pitch correctors, a combination of EQ, stereo enhancement and other techniques to make it more polished and balanced.[6]

AI has revolutionized the discovery and recommendation of new music. It can analyse user preferences, listening patterns, and genre characteristics through advanced algorithms and machine learning to provide personalized recommendations.[7] This is clearly evident with our daily use of mobile applications and other electronic medium.

Along with these positive aspects of AI, there are also negative implications and the major concern is the potential loss of human creativity and originality. AI generated tracks could lead to a decline in uniqueness of musical expression. There could be the possibilities of copyright issues in AI generated music. A survey has

been conducted by Becky Buckle, London based Multimedia editor, Mixmag in 2023 on necessary of having restrictions in using AI in music. According to the data, the IFPI (International Federation of the Phonographic Industry) collected responses from over 43,000 music fans from across 26 countries discovered that most music fans believe restrictions should be put in place on using AI in music.[8]

BLOCKCHAIN TECHNOLOGY AND NFTS

Blockchain is a type of data structure that was first proposed in Bitcoin for peer-to-peer payments. Here each block consists of transactions for a period of time and is joined to a chain like data structure and has its own hash value. Since the hash value is contained in the next block the content in the block is tamper resistant and traceable.

The use of blockchain technology is the other trend that has gained popularity in the music industry. It is a secure decentralized data base that can be used to improve rights and royalty process and to make distribution more efficient. Nowadays, it is easy to listen and download music with a click of single button, but payments to the artists who creates that music can be slow and not transparent. Blockchain technology offers transparency through the value chain. Musicians can see exactly how much money they are owed. The technology could solve the issue of identifying a real copyright holder and ease the challenge of tracking derivative works through the value chain. This would create a peer-to-peer ecosystem for artists that enable them to control their own destiny and receive the fair compensation for the value they create.[9]

NFTs are digital certificates of ownership that hold unique value. Each NFT is distinct and cannot be exchanged on a one-to-one basis, hence the term “non-fungible”. NFTs are a file format for transferring data and value on blockchain networks. A music NFT (Non- Fungible Tokens) is a digital asset which is issued in Blockchain and is linked to an individual song, album or a video clip. NFTs have given artists an opportunity to retain the copyright and reproduction rights for their work. Musicians can use NFTs to tokenize their music, resulting in unique digital assets which can be sold to collectors. These tokens represent digital content ownership, which may include exclusive access to music, merchandise, or concert tickets.[10]

There are various types of Music NFTs. One of the popular types are Ticket NFTs where vouchers for live or online music performances are created and distributed which reduces fraudulent ticket distributions. Some popular music NFT platforms are Audius, Sound.xyz and Royal. These platforms can decentralize music using blockchain technology. Artists can have ownership of their music and can decide how to monetize it on these platforms. Artists can even customize the royalty payments.[11]

Following is an analysation of a discussion by Warner Music's CDO and Sam Ewen on the future of music in blockchain and NFTs at Consensus 2023 (Retrieved from YouTube on Nov 10, 2024). The discussion centres on the future of music in the context of blockchain and NFTs highlighting innovation, community engagement and new monetization strategies. The impact of Artificial Intelligence in music creation has definitely allowed more people to engage.

The blockchain technology can enhance tracking and rights management in the music industry. This ensures artists receive fair compensation and recognition for their work. They have also discussed about artists being updated about the revolutionizing technologies which can maintain a good relationship with their audience across various platforms. The discussion emphasizes the need for authenticity, community engagement with a focus on building long-term relationships with fans and leveraging technology to enhance creativity and fan experiences.[12]

The future of technology lies on the development of Web3 space. Web3 is webpages generally believed to be involving 3D graphical interfaces which could have the technologies of blockchain, NFTs and Future

developments of AI. This could enable to bring about new ways for artists and audience to connect in the metaverse.[13]

AUGMENTED REALITY (AR) AND VIRTUAL REALITY (VR)

Augmented reality (AR) is an interactive experience that uses computer-generated information to improve the real world, including visual, audio, and haptic and other sensory components. One of the most important ideas in the music industry right now is Augmented Reality. It incorporates virtual elements into real-world situations. Advancements in digital technology, such as the internet, smartphones, and music streaming platforms, have enabled the use of AR in music video creation, which is essential for marketing and promotion. AR can also be applied in a variety of ways in live music performances, which helps maximise the interactivity.

It allows for immersive storytelling during live performances, where artists can combine real-world elements with virtual narratives to create engaging plots. It also acts as an additional source of income that will be taken advantage of by the industry. These live concerts can also push the physical and geographical limitations, allowing the audience around the world to attend the shows through AR- enabled live streams and apps. This technology expands the accessibility of the concerts for a wider audience.

Virtual Reality technology puts the user in a computer-generated environment, allowing them to interact with simulated elements via a headset. Furthermore, the use of AR can be expanded significantly to transform in music education system for future generations. This can be very helpful as many of them rely on online classes, that can connect the trainer and the learner even countries apart.[14]

CONCLUSION

In conclusion, the advancements in science and technology have a great impact on transformations in music industry in all aspects. The technologies developed in the twentieth century in music production has enabled musicians to create innovations. The professionals, semi-professionals and amateurs will use DAW to produce their music works. Music streaming platforms enabled world-wide distribution and collaborations of music. It is easier to listen to music nowadays with the discovery of music streaming platforms. The current trends like AI, blockchain technologies and NFTs have also influenced the music industry in creation, distribution, consumption as well as monetization.

The AR and VR technologies are also in their developing pace to influence the industry. The innovations in the music production are clearly visible with the development of these technologies. While these technologies provide new possibilities for accessibility, efficiency and artists empowerment, there might be chances of challenges like originality, intellectual property rights and maintaining a balance between human creativity and machine support. This paper provides some references and inspiration for further investigations on the developing technological era as well as to overcome the challenges if any.

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