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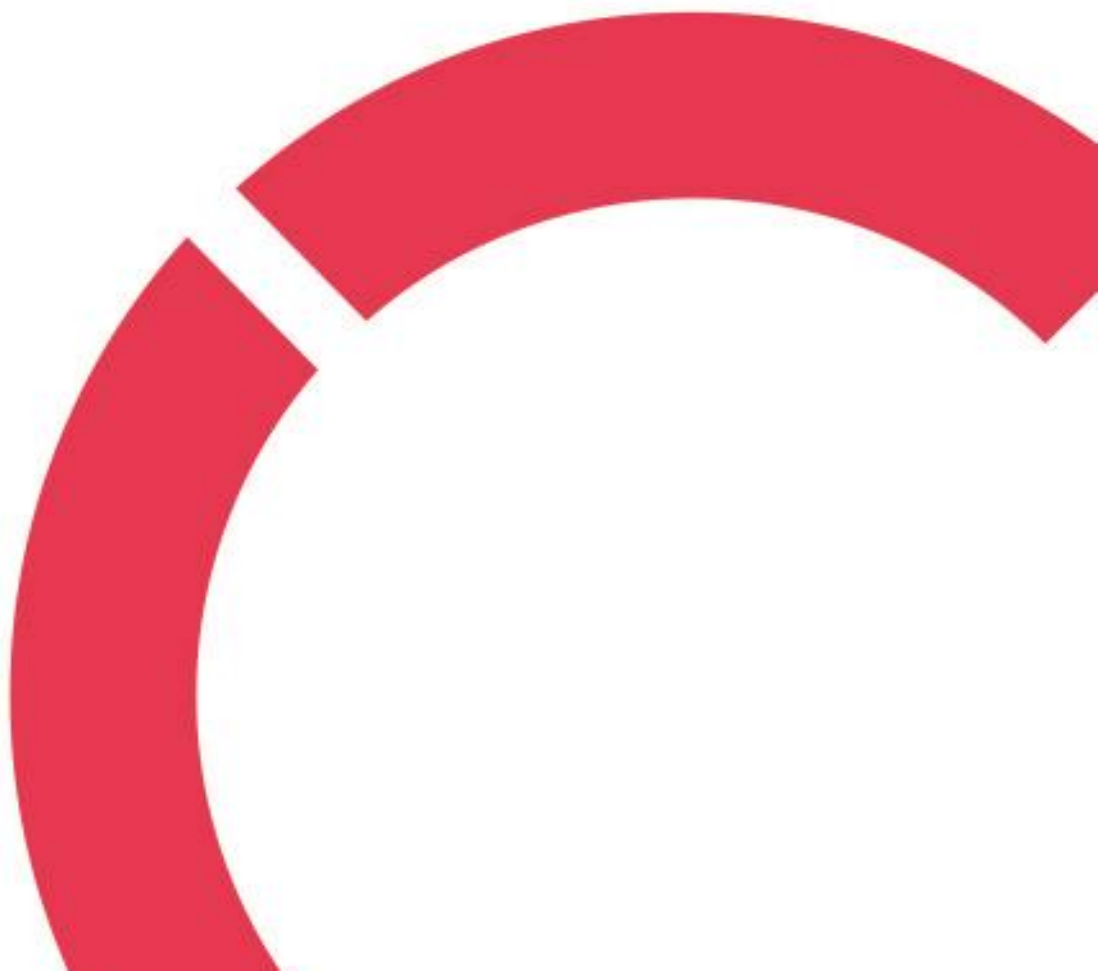
**THE IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN MUSIC BUSINESS  
INDUSTRY**

**Thesis**

**CENTRIA UNIVERSITY OF APPLIED SCIENCES**

**Business Management SAP/ERP**

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**ABSTRACT**

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<b>Name of thesis</b> THE IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN MUSIC BUSINESS INDUSTRY		
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<p>Artificial intelligence tools now offer understanding into a few the issues that previously perplexed stakeholders throughout the music industry. Labels are now able to make more informed decisions about their investments thanks to analytics and prediction models, which are based on a more thorough understanding of the audiences' tastes and the competitive landscape. AI technology will not go away. Beyond comprehending listeners and their preferences, it is nevertheless being used in novel and creative ways and it is now the most recent technique for making music.</p> <p>The goal of this thesis was to focus on analysing and determining how AI tools have an unparalleled impact on music creators, sellers, and consumers. In this thesis, the theoretical part focused on a continually shifting industry with overstimulated customers. AI has been the only technology breakthrough that has offered clarity for brands, creators, and other industries. Therefore, application of AI and machine learning helping to guarantee a positive listening experience are services like Spotify and Apple Music, which are responsible for most of the industry's revenue. User demographic, listening, and other behaviour data help the platform make better suggestions for artists and albums. This research will employ a qualitative research design, surveys, and case studies to gather data. The sample will consist of music industry professionals, including musicians, producers, record label executives, and technology experts. The data will be analyzed using thematic analysis, identifying patterns and themes in the data.</p> <p>In conclusion, this thesis will contribute to the understanding of the impacts of AI on the music industry. The findings will provide insights on how AI is changing the way music is created, distributed, and consumed and its implications for the role of musicians in the industry. The research will also identify the opportunities and challenges that AI presents for the music industry and its prospects.</p>		
<b>Key words</b> Artificial intelligence, analytics tools, marketing, music business, music chart, music publisher, streaming data.		

**ABSTRACT**  
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## 1. INTRODUCTION

Artificial intelligence and algorithms are being used in every element of daily life because of the growth and progress of technology. Among these products that really have gained popularity in recent years there is Yang and Nazir (2022). Novel and clever methods powered by AI are revolutionizing the music business. These tools make it very easy for musicians to create high-calibre music. The newest field where artificial intelligence-integrated music is employed is in the creation and organization of sounds for various media, including the Internet, video games, and other platforms. Most of the music was performed live, and artists were hired to perform at gatherings and celebrations. Record labels started to appear once the phonograph was created in the nineteenth century when recording became a substantial part of the business. With the development of television and radio, the entertainment industry grew steadily throughout the twentieth century. The promotion of musicians and music was greatly aided by broadcast stations, as well as live concerts were made available to viewers at home via television. The sector was completely transformed by the arrival of digitalization throughout the 1980s, especially with the creation of CDs (Compact Discs), which allowed for improved audio reproduction and longer playback times (Yang and Nazir 2022).

AI has emerged as a critical instrument for many facets of music-making, dissemination, and consumption. The entertainment industry may use artificial intelligence to generate data-driven ideas into decisions, streamline operations, improve creativeness, and give customers individualized music experiences. Music production is among the main uses of AI within the music industry. AI programs can compose music, decipher, and transcribe already-existing music, or even play musical instruments or play music utilizing robots. AI is utilized in music making in addition to music production to streamline and improve a variety of procedures. To enhance audio quality, for instance, AI systems can examine audio files and automatically change settings like equalization, volume, and compression (Venkatesh, Moffat, and Miranda 2022). AI can aid producers in the mastering and mixing of music, enabling them to produce better outcomes faster. Music producers now have access to a growing number of Automation plugins as well as software solutions that are intended to boost efficiency. The discovery and

recommendation of content is a crucial use of Artificial Intelligence in the music sector. AI systems can assess a recipient's viewing history as well as preferences to propose new music which are probably going to enjoy. Recommendation algorithms that are AI automated are frequently used by platforms like Pandora and Spotify to keep listeners interested in and subscribing to new tunes. AI may additionally be utilized to generate customized videos, soundtracks, live event recommendations, and other aspects of personalizing music experiences. Finally, artificial intelligence can completely transform the way that the entertainment industry manages copyright and royalties (Venkatesh et al. 2022). The management of royalties and copyrights has gotten harder as digital content has proliferated, making it more difficult to keep track of them.

Regardless of the myriad of (Venkatesh et al. 2022). Others fear that as consumers become more dependent on algorithmic suggestions, AI-driven media recommendation systems may result in a uniformity of musical preferences. Concerns have also been raised regarding how AI would affect music business employment, as some occupations may be mechanized or transferred to Artificial Intelligence systems. The goal of this thesis ed, disseminated, and consumed considering the breakthroughs that it has introduced to the sector.

The most recent and potentially disruptive advancement of technology in the music industry is the use of artificial intelligence in producing music, dissemination as well as consumption. AI has the potential to fundamentally alter the music industry, yet it additionally raises questions about how it can impact style. To determine how much the role of human producers, the protection of rights, and the worth of songs might transform as an outcome of the rising use of digital technology in song making, distribution, and reception, the study aims to examine the AI's impacts in the world of music.

The overall goal of the research is to determine how AI technology is affecting the music industry. The specific objectives include identifying how AI is being used in music production and its impacts, determining the implications of AI in music distribution and consumption, and additionally determining the effects of AI on the role of musicians in the music industry.

To study the impacts of AI in the music industry, the study will address questions like how AI is being used in music and what are its impacts. What are the implications of AI in music distribution and consumption? How is AI affecting the role of musicians in the music industry?

As AI transforms many areas of music generation, delivery, and utilization processes, understanding the effects of AI on the music world is becoming more and more crucial (Ahmad, Zhang, Huang, Zhang, Dai, Song and Chen 2021). Understanding how AI affects artistic thinking can provide information about how AI could be applied to boost innovative thinking and inventiveness within the music business. The creation of lyrics, music, and even songs is now possible because of Artificial Intelligence. This raises concerns about the potential effects of this technology on the creative process and whether it will alter the position of traditional artists and composers. Learning more about these effects will help one predict how music will change over the next decades. Experts in the sector can use this information to assist them to decide how to adjust and compete effectively in a continuously changing environment. The ethical implications of AI for the use of imagination, the possession of property rights, and the possible effects on artists and others employed in the business are significant. Experts can grasp the potential pros and cons of Artificial Intelligence in song writing by researching these ethical aspects and can fight to ensure that this innovation is applied in a responsible and moral way. Additionally, experts can learn how AI may be utilized to improve the development and dissemination of songs by examining the effects of AI inside the music profession. This knowledge can help create more complex and advanced AI tools that are specifically designed for the entertainment industry.

## **2. LITERATURE REVIEW**

### **2.1 The Concept of AI**

Artificial intelligence refers to brain ability created by a machine in the fields of computer science and technology. It describes the potential of a machine or other systems to mimic the traits of a person's mind by simulating its intelligence (Ahmed 2023). The creation of smart machines which can carry out tasks that typically necessitate human intellectual ability, such as speech recognition, processing of natural language, visual perception, and decision-making, falls under the broad umbrella of AI. The foundation of artificial intelligence accomplishes this.

According to Ahmed (2023), John McCarthy has been credited for to develop computer systems that better comprehend the human mind and replicate how humans make judgments. Many individuals use services for cloud computing, which allow users to exchange data. Large volumes of data are now readily accessible, and technological advancements have made it possible for machines to interpret and manipulate data more effectively than people (Ahmed 2023). This has led to an explosion in the rise of AI. Apple's Siri and Amazon's Alexa are two modern instances of AI. They assist users in finding links to probable purchases based on current requests and may identify spam messages while also assisting in the detection of fraud (Patrick, 2020).

### **2.2 Types of AI: Categories of Artificial Intelligence**

Artificial Intelligence has been categorized into two main groups that are defined by functionality and capability. This section outlines these categories with details on their distinctive characteristics and functions. The different types falling under these categories are also outlined in the sub-sections.

### 2.2.1 AI as functionality

The main goal of such an Intelligence system is to carry out a specified function. They are further broken down into the subsequent artificial intelligence classes.

**Reactive Machine** Perhaps among the oldest types, reactive machine artificial intelligence is unable to use prior facts to setting long - term goals because it lacks storage (Ahmad 2021). Reactive machines imitate how a human would respond to certain stimuli. These machines, therefore, are reactive to every kind of behaviour that is carried out before them. They can be able to create a reaction based on that. The period when a supercomputer defeated Garry Kasparov at a chessboard is a good illustration. That marked the final man-against-machine fight, and IBM's Deep Blue emerged victorious in the 1990s (Bory 2019). Such kind of AI technology lacks internal memory and is reactive. In the game, it could recognize every piece as well as their movements. It was successful in overpowering the smart human. However, it remained a simple AI system that could likely exceed the perfect human being on his best day (Davenport and Ronanki 2018).

**Limited Theory AI** are machines that have a limited amount of memory capacity. Using these AI tools, people can draw conclusions based on historical data that will help them make better choices ahead. The best examples of these models can be found in AI-built GPS technology and car simulation techniques (Bory 2019). They can offer users valuable information for evading traffic bottlenecks, choosing the best paths, and even lowering the danger of potential accidents.

**Mind Theory AI** (Perbet, Song, Zhang, Eslami, and Botvinick 2018). Many studies are being conducted to create machines with an intrinsic sense of judgment that will enable robots not only to interpret study data but even evaluate it for their benefit. The robots that are nearest to the situation can currently understand stairs as well as robots arriving from a different direction. The robot can devise a secure descending passage based on how it interprets obstructions (Rabinowitz 2018).



Self-Awareness AI represents the most sophisticated one that has ever been created by humans. Self-aware AI has features such as the capacity to think independently, aspire, and comprehend its emotions, in addition to the capacity to identify and imitate fully functioning human actions (Reynoso 2022). Self-aware Artificial Intelligence is a development and expansion of the mind theory of AI. Self-aware Artificial Intelligence extend it by suggesting that it is capable of and exhibits self-guided ideas and responses, whereas the mind theory merely concentrates on the features of understanding and reproduction of human behaviours.

### **2.2.2 AI as Capability**

Identifying a single, reliable set of abilities or competencies for Intelligence machines is indeed the key to categorizing AI under this area. The functionality classes which have been developed serve as the foundation for capability-oriented Artificial Intelligent types.

Narrow AI type forbids computers from carrying out several tasks at once. When it attempts (Reynoso 2022).

General AI is the next phase in digital intelligence, in which self-help cyborgs or robots would mimic human sensory activities. With this kind, (Reynoso 2022). Future AGI injectors will be powered by advances in artificial nerve networks and eventually operate a business.

### **2.3 How AI has been applied to Industries**

From banking to healthcare to transportation, AI has had a broad spectrum of potential uses. Across a wide range of industries, including human resources, healthcare, sales, marketing, operations, manufacturing, and technology, artificial intelligence can be used in a wide variety of use (Joshi 2019). Some application cases involving AI which are commonly investigated include the internet of things (IoT), self-driving vehicles and other automated technology, robotic

manufacturing assistance, medical diagnostics, contactless payments, job candidate selection Secinaro, Calandra, Secinaro, Muthurangu, and Biancone (2021).

AI has aided doctors and other healthcare experts in several areas, including medical imaging, syndromic and epidemic surveillance, geocoding health data, forecasting and decision assistance, and medical records through AI's complex algorithms. AI makes it simpler to translate data into tangible, practical observations to enhance medical decisions, provide quality patient care, handle crises in real time, and further preserve lives (Secinaro et al. 2021). Additionally, AI also makes it simpler to use money effectively to construct facilities and systems and lower costs at the organizational level.

By utilizing the capabilities of machine intelligence to offer savvy categorization and smart detection, financial businesses are digitizing manual operations, such as payables processes (Cao 2022). To reconcile, speed up approvals, and detect fraud, ERP systems with designed AI software can now test physical receipts, identify the crucial information like supplier name, materials purchased, and costs involved, and auto-enter this into ERP systems. Companies may redirect employee performance from physical data gathering, aggregation, and filing to analysis, planning, and action through automated financial closure procedures. Businesses are implementing AI-guided virtual assistants that facilitate content discovery and task completion (Cao 2022). In the transportation sector, as stated by Joshi (2019), artificial intelligence has been used in areas such as cars that are self-driving, traffic control, predictive servicing, supplier chain, logistics monitoring, and overall user experience. Driving can be made safer and much more productive with the help of AI algorithms, which can monitor real-time traffic information, modify stop signs, and offer routing suggestions to motorists. Passengers can receive personalized suggestions and services via Intelligence systems, which include real-time journey planning, in-car music, and tailored marketing (Joshi 2019).

Artificial intelligence tools including natural language processing, robots and machine learning have been applied in the manufacturing sector. Among other functions

## 2.4 AI Application in the Music Industry

The entertainment industry has been impacted by AI, which has brought about fresh approaches to the production, sharing, and enjoyment of music. Automation has been used in music creation to produce brand-new songs, remix old ones, and produce soundtracks for games and films. To create new tunes and rhythms, algorithms that utilize machine learning can examine existing songs to identify trends. AI-powered programs like AIVA and Amper Music may create and produce music depending on user information and inclinations (Miranda 2021). Music producers and composers can concentrate on other parts of music created by using these technologies to save their energy and time.

The algorithms of machine learning can change the way that people think about music by expanding the range of compositional options and fostering the formation of fresh artistic ideas and methods (Miranda 2021). Algorithms based on machine learning are also used in recommendation engines, like those employed by music services like Apple Music and Spotify, to examine consumers' listening behaviours and tastes. These algorithms look for trends in the recipient's listening habits and utilize that data to make suggestions for new tracks, musicians, and soundtracks that are most likely to catch the customers' attention. Discover Weekly by Spotify is one illustration of this kind of recommendation engine. Approximately 40 million people who use this platform subscribe to Discover Weekly tracks per week, demonstrating its great success (Miranda 2021). AI-powered simulated artists and ensembles are only one example of how AI has been employed in musical theatre. This can be seen in the virtual ensemble Amadeus Code, which creates pop-tune lyrics and music using AI.

AI has additionally been employed to improve live shows, for example, by powering stage visuals and illumination. Real-time responses from these devices to the sound being produced can give audiences engaging visual experiences. Furthermore, AI is being utilized to identify and stop copyright violations. The creation of material recognition tools that can recognize copyrighted content in internet content like videos, live streaming, and consumer content itself is a method AI is utilized for this goal (Burk 2019). Copyright holders can utilize these techniques to detect malicious use of intellectual rights and enforce their rights by comparing the audio profiles of the material with a list of known musical works using machine learning algorithms

(Miranda 2021). One illustration of a material recognition technology that makes use of AI to identify copyrighted works in consumer content is YouTube's Content ID system (Burk 2019). The creation of blockchain-based intellectual protection mechanisms using contracts to systematize royalties' payments and guarantee that musicians are paid properly for the usage of their material also makes utilization of AI.

## **2.5 Shortcomings of AI in the Music Industry**

Several facets of the entertainment industry, particularly music production, distribution, and reception, have been transformed by the usage of AI. However, just like any other technology, AI has some drawbacks that need to be addressed. The dearth of creativity and originality in AI-generated songs is one of the main issues. The emotional dimension and distinctive standpoint that come with human creativity are lacking in AI's ability to produce music that sounds as though it were written by a person. According to Hernandez-Olivan and Beltran (2022), AI-generated songs' uniqueness and capacity to engage people on a profound level may be constrained by the absence of the capacity to comprehend historical and cultural contexts. Additionally, AI-generated music frequently struggles to come up with fresh concepts or break from a unique style or type. This may reduce its ability to produce truly avant-garde and ground-breaking songs. As a result, while AI-generated songs may be valuable in some situations, they might not be capable of taking the position of human artists' creativity and ingenuity. The possibility of employment redundancy is another issue with AI's application throughout the music business (Hernandez-Olivan and Beltran 2022). The employment opportunities in the business may decrease as AI systems continue to advance and eventually replace certain human songwriters, editors, and performers. This might have a big social and economic effect, especially on people who work in the music business. Additionally, to these limitations, there are problems with the precision and calibre of music produced by AI. While AI can produce music that resembles that of a real human composer, it is sometimes unable to match the intricacies and details of human performance levels (Hernandez-Olivan and Beltran 2022).

## **2.6 Theoretical Framework: The Theory of Disruptive Innovation**

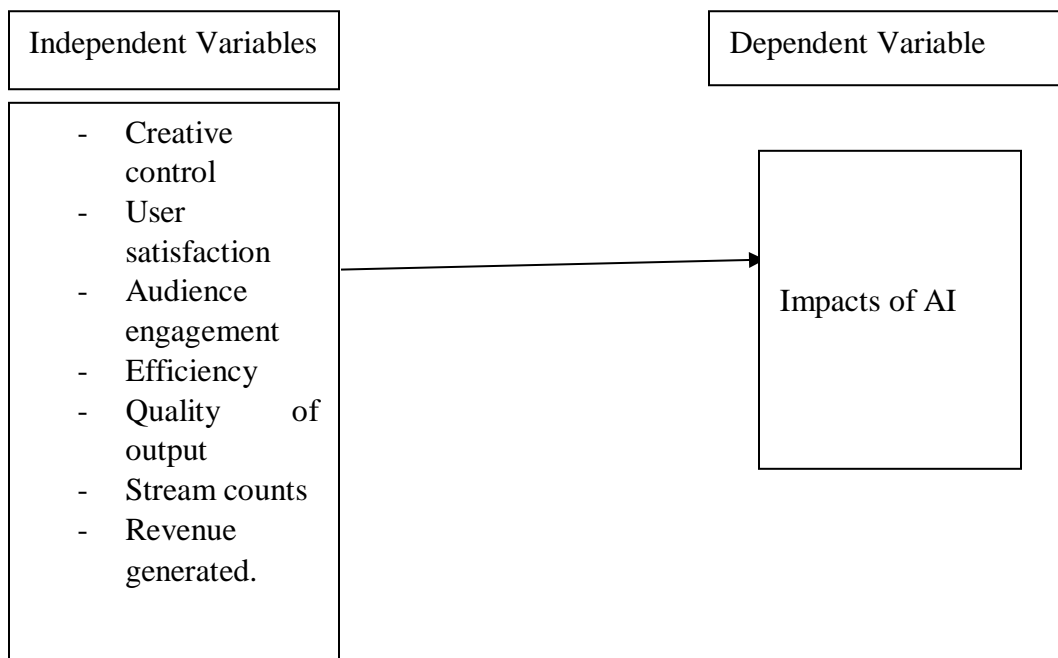
Disruptive innovation has become a catchphrase since Clayton Christensen first applied it to describe how new market competitors can upset established companies in the 1990s. The theory states that a product or service initially establishes itself in fundamental roles somewhere at bottom of a sector by being less costly and more accessible, and then it advances brutally upward, finally displacing established rivals (Larson 2016). Although disruptive innovation frequently begins in niche sectors, it has the potential to eventually impact whole industries and change the balance of power between established players and newcomers. The production and consumption of music are both being drastically altered by artificial intelligence, particularly generative AI (Larson 2016).

The practice of making music is rapidly evolving from being the exclusive purview of a select few who have the necessary tools and decades of expertise in musicology and creation to one that is open to anyone (Sturm, Iglesias, Ben-Tal, Miron and Gómez 2019). Also stretching the limits of what is conceivable regarding song creation involves AI-automated music. The opportunities for discovering and experimenting with the song are unlimited because it is possible to produce countless versions of one track. AI can be used by musicians to explore fresh soundscapes, alternate rhythmic patterns, and even new genres by fusing various existing forms with novel sounds (Lee, Lin, Hu, Gong, Kumar, Li, Li, and Hui 2021). The song discovery process is getting more customized in recent years because of AI's capacity to comprehend and adapt to consumer preferences (Sturm et al. 2019). By balancing the competitive landscape for independent musicians and producers, AI is decentralizing the music business. As Sturm et al (2019) assert, AI is enabling a fresh era of artists and music producers by providing everyone with the resources they must have to produce songs of high resolution.

## **2.7 Conceptual Framework**

The conceptual framework will consist of the dependent and independent variables. An independent factor is a parameter that the analyst controls or manipulates. This variable is known

as the independent variable, which is the factor that is assumed to have some kind of causal influence on the dependent variable (Bulturbayevich and Abdulkholik 2022). A dependent variable, on the contrary, is noticed or assessed because of shifts in the independent factor. The independent factor's value determines how much the dependent variable is worth (Bulturbayevich et al. 2022). The framework to measure the impacts of AI will be presented in figure 1 below.



### **3. RESEARCH METHODOLOGY**

The analyst explains and attempts to defend the research concept and methodology adopted for this study in this section. Therefore, the selected methodological technique and structure are outlined and described for the purposes of this study. This is then followed by the design of the study, which includes the selected study materials, procedures, and quality assessment process, and then a summary of this section. The author will be able to learn important information about the topic's constituent pieces thanks to the qualitative technique the researcher has chosen. Five primary components make up the technique utilized in the present systematic study, developed by renowned researchers Arksey and colleague O'Malley (2015). (Westphaln, Regoeczi, Masotya, Vazquez-Westphaln, Lounsbury, McDavid, Lee, Johnson, and Ronis 2021). This includes outlining the research question, identifying, and choosing relevant articles, organizing the data and facts, and assembling, reiterating, and displaying the findings.

#### **3.1 Research Design**

In this study, the researcher was applying a thematic research design. A qualitative survey technique termed thematic evaluation was used to find and examine themes and trends in data (Castleberry and Nolen 2018). The findings of specific research connected to the implications of Artificial Intelligence on different sections of the entertainment sector were gathered and synthesized using a thematic approach in the framework of a systematic examination of the effects of Artificial Intelligence in the music business. The primary goal of the investigation was to clarify the research topic; thus, the investigator was carefully identifying the study's major components. Additionally, the methodology selected and applied technique gave the researcher access to thorough and trustworthy material to deal with the study issue.

## **3.2 Methods and Procedures**

The methodology which the researcher utilizes in this research is described based on the selection of the articles utilized for the literature review, data organizing, data collection, findings reporting, and quality control.

### **3.2.1 Relevant Materials Identification**

According to this perspective, systematic research is the best technique for compiling and evaluating primary literature. These criteria were met by the publications that were considered inside the initial investigation draw: they included pertinent details regarding the position of machine learning in music composition, reception, dissemination, suggestion, and copyrights. Research publications were excluded because they covered topics unrelated to the effects of Machine learning on the music business. To locate publications that would meet the requirements for inclusion, summaries, and affiliations were individually examined. Full-text versions of these articles were gathered and separately assessed to make sure they met the criteria for acceptance.

### **3.2.2 Data Charting**

The data-gathering methodology was created using the Ms. Word application with the main goal of outlining the conclusions and significant facts gleaned from the comprehensive literature procedure. The method used by Bettany-Saltikov (2010) to divide the information extraction chart into six main columns, including the research subject, details(name) of the researcher(s), publication date and year, a condensed description of the results, as well as the purpose of research, was utilized. The researcher looked closely at several research papers to create the original draft of the studies addressing each of the research questions. The value of the details retrieved from the scholarly review procedure was enhanced by a series of assessments of the information collection method.



### **3.2.3 Data Collection, Summarizing, and Findings Reporting**

The researcher's data and material from the primary topics were rigorously examined, and the researcher carefully arranged the individual categories produced for each subject for the sake of display. By comparing and analysing the results of other related works, this research provides impartiality to the examination of other pertinent research publications. The development of the charts used to convey the key outcomes of this survey is described in the chapter that follows. The parts that were taken out of the main subject were not always related to one another. A couple of the papers used parts of the subject of this study while addressing other subjects.

### **3.2.4 Quality Assurance**

The evaluation procedure was thoroughly piloted, along with the computerized key phrase, picking and exclusion standards, and the categorization of files and charts, using a small sample of already published journal articles. The researcher was taking serious note of all the changes. Most significantly, the analyst was ensuring that all pertinent studies as well as literature were incorporated into the comprehensive study by taking the essential precautions to successfully reduce biases. All the discovered subjects and topics were subjected to the selection and exemption procedures by the researcher. Complete details on the subject were acquired. Also, the researcher assessed all the research for their prospective inclusion. Then, all the linked journal papers underwent coding. Finally, a separate assessment was done of the final study's procedure and copy.

### **3.2.5 Ethics**

The investigator maintained a record of the major references related to the in-depth analysis to create sources and bibliographies while summarizing its findings. The study required ethics approval, although in this case an engagement agreement was not required. In addition, no publication permission was required. The adoption of a systematic approach is not regarded to have any risks or downsides.

## **4. FINDINGS**

The audience is primarily presented with the findings and evaluation from the investigator's comprehensive investigation in this segment. The portions that collectively make up the section's body combine the study's main conclusions with an appraisal of the concerns they raise. The purpose of this section is to provide readers with an understanding of the investigator's findings and analyses in relation to the various theoretical frameworks developed and used in this study.

### **4.1 AI in Music Production and Implications**

Knotts and Collins (2020), in their survey of 117 respondents gathered data on the usage of both commercially available and custom-written audio AI tools. The respondents listed a variety of musical outcomes, including generating recordings, performing live, and creating music spanning many different genres. There were fifteen queries in the online survey that was administered. These essentially fell into three main groups: participant personal details, software utilization, and attitudes toward AI. These inquiries were created to determine the extent of music artificial intelligence adoption across self-selected music technology populations, where relevant background knowledge may predict the adoption of machine learning and attitudes associated with it.

Only nine participants had fewer than three years of expertise using music-making software, which indicates that nearly all of those questioned had been long-term users of music-making software. Even while more than half (53%) derive a portion of their revenue from making music, only 7% of those surveyed said that this serves as the main means of income. Around 30% of those surveyed report having no revenue from making music. Those surveyed create songs in a variety of genres, with recordings accounting for 71%, computer-assisted improvising accounting for 61%, and generative work taking up 53%, being typical forms. A lesser fraction of 16% of those surveyed identified as DJs, while 45% of interviewees were live programmers, mirroring the connections and hobbies of the researchers.

Two primary topics in the segment on using software examined how people used already assembled music AI programs and programming instruments to create their own music AI platform. The listed technology is the result of the authors' inquiry into generic music programming languages that are commonly used and has AI frameworks or the capability for self-built AI instruments, as well as music-related software programs that assert to employ or provide AI features. The bundled software has not been used by most responders. The most rarely used applications were Alysia and Amper, followed closely by Juke Deck and Aiva. This finding may not come as a surprise given the lack of interest among music engineers in software that can produce entire songs with the resistance of self-employed composers to shell out money for pricey subscription services. Of these programs, Juke Deck became the sole application to record both infrequent and regular users. Software programs that tackled specialized tasks in song creation, like Landr, as well as free and more adaptable tools, like Magenta Workshop and Wekinator, or Logic's MIDI scripiter, which incorporates more quickly into current workflows, were utilized more frequently than others.

Many study respondents acknowledged that song writing AI had simplified the creation of songs and impacted their musical taste, but the majority disputed that negative impacts including the demise of artists' jobs, standardization of music, and stalling the progress of songs will materialize. Artificial Intelligence is the way to the next generation of music, a majority agreed. Most people who were familiar with song AI's practical applications did not perceive it as an important change in artwork or culture, but rather as merely an addition to the existing tools already presents in the field of music. Will as well as tools were frequently used, according to a vocabulary cloud study. This indicated that interviewees frequently discussed artificial intelligence (AI) in the years to come as a term that primarily includes human involvement instead of independent machine inventiveness. Although the subject of song AI elicited strong reactions from certain respondents, a simple tally of positive as well as negative remarks revealed an equal amount of both, indicating that everyone who took part had an equal assessment of the technology.

## 4.2 AI in Music Distribution and Consumption

Nowak and Bennett (2020) examined how members of Generation Y, who were still children when digital music innovations were being developed, have embraced, and utilized those novel possibilities in technology while retaining a connection to other mediums and innovations like the CDs, vinyl discs, and finally the cassette recording. Their paper offers a sociocultural viewpoint on how people who have mainly defined their music-consuming habits use music techniques. These writers defend their methodology against claims that either characterize digital innovations as a revolutionary that swept aside all prior technologies or assert that certain technological advancements are associated with specific generations.

The first important finding through empirical study is that people do consider how every song option influences a certain way of listening to music. This is about how various technologies can help people identify and hone their musical preferences. They concluded that one form of consumption correlates to one kind of technology, and they argue that people's consumption habits demonstrate that different types of technologies may not be incompatible. People contrast and compare music innovations on grounds more than just practicality. The adoption of technological advancements is seen as a supplement to current norms. They allow people to explore more of their musical interests across a variety of genres. Members representing Generation Y demonstrated a wide spectrum of musically distinct consumption habits. Instead, then fundamentally altering Generation Y's perception of songs as an expressive medium, technological advancements have helped to expand their knowledge of how songs can be found and played. Their usage of diverse technologies, which are then defined with distinct utilitarian and aesthetic connotations, is mediated by the environments in which individuals grew up. The adoption of digital technology is conditioned by already present music consumption habits (Nowak and Bennett 2020). Even if new technical advances may make it easier to enjoy listening to songs in daily life, they are nevertheless viewed in comparison to older, more established technologies. All survey participants expressed interest in creating music consumption models using various technologies. Nowak and Bennett (2020) claimed that the idea of technological eclecticism could adequately describe their consumption patterns.

Nowak and Bennett (2020) argue that the diverse materiality and opportunities of technologies, that are viewed as alternatives to enact people's musical preferences, are supported by technological eclecticism. The expansion of listening alternatives improves people's oversight of their audio settings, which enables them to avoid songs that they do not like. The relationship of the aesthetic qualities of a song with the tangible nature of music technology is another pillar of technical eclecticism. The connection between technical eclecticism and musical taste that combined the technological needs of recording music creation and dissemination with artistic or aesthetic factors was underlined by Nowak and Bennett (2020). According to the authors, technical eclecticism overlaps components of aesthetics, materiality, and musical genres, including projected affective reactions that people feel throughout intake practices. It is characterized by how people encounter various music formats.

In another study by Tigre and Maw (2021) on perceptions of AI-composed music among users, it was observed that people had a generally unfavourable opinion of AI songs, a low purchasing motive, and an unfavourable credibility regarding musicians that use AI. The outcomes of the study showed no significant changes between the various groups, indicating that knowledge of the application of automation had no effect on how the music was perceived. The authors assessed the perspectives of music industry experts (72) and non-industry listeners (374) in an online survey with 446 respondents. (374). Then, in a subsequent 2 by 2 laboratory test, 86 volunteers listened to music created by AI while being given various accounts of the composing process.

### **4.3 AI and the Role of Human Musicians**

Suh, Youngblom, Terry, and Cai (2021) did a study on how AI might have a significant impact on human interactions during creativity where thirty participants (fifteen pairs) were observed composing a musical phrase in pairs without and with artificial intelligence as part of a qualitative laboratory investigation. They organized their research around the following five main themes: Artificial Intelligence as an engine for advancement, a psychological protection net, a social lubricant as well as AI as a drive that modifies the innovative and cooperative responsibilities of human structure. frequently discovered a common foundation by talking about the music that the

AI produced. In their analyses, partners noted that it was advantageous to be allowed to centre their conversations around the subject of AI-generated songs rather than having to stick to talking about their creative concepts. Participants were able to learn more about one another's preferences through conversations regarding the AI-generated songs. Because AI made it possible to root themselves in already existing material without the need to first organize who was going to be developing which pieces, several pairings found it was simpler to get into collaborative workflows when the technology was present. Participants found the AI-generated output's role as a dialogue starter useful for establishing common ground. Additionally, it gave the composition some initial propulsion.

AI offered a mental security net throughout co-composition in addition to shared grounding. conviction, that one would not be humiliated or rejected in each situation or job, serves to promote information communication, collaborative learning, and teamwork (Suh et al. 2021). Both amateur and professional composers were occasionally fearful of feeling ashamed or scrutinized while they composed notes with one another. Participants believed that this insecurity may result from the burden of working with an audience; they stated that, while creating alone, they would typically feel less restricted to discovering and testing. On the other hand, other participants claimed that the presence of AI allowed them to feel less stressed and amused. Only a few participants claimed to be more open to trying new things. The pairs with less musical experience were more likely to exhibit this openness to discovering new areas. The consensus among beginners was the belief that AI's instruction was superior to their own knowledge of music theory as well as that it could, at minimum, prevent their compositions from sounding illogical.

Suh et al. (2021) found that AI served as an agent for advancement as well, making the co-composing activity simpler for users. Some people thought Artificial Intelligence was particularly helpful for helping individuals get going quickly and gain momentum. Users perceived that each iteration was sometimes hampered by the need to generate and record ideas starting from scratch given the absence of AI. Most users stated that receiving a few starting points to utilize as a springboard for concepts was far simpler than trying to create fresh material from zero.

While some people believed that AI accelerated their early efforts, others said it assisted develop out or extend work that had already begun. In addition to creating material, AI-assisted users in developing their artistic judgment. Some believed that, in addition to limiting the range of options, AI also aided their growth by widening the range of possible ideas. While composing, several people also came up with original ideas while deciding how to utilize the AI-steering controls. While most participants thought AI sped up progress, one couple noted that it offered an extra layer of making choices that would slow development. By providing a way ahead and by changing social relationships out of human-human distinctions and into human-AI variations, AI helps reveal and reduce latent resistance.

However, Suh et al. (2021) discovered that the existence of AI tools also had an impact on the users' creative and collaborative responsibilities in the creation process. While most participants stated that AI resembled an additional collaborator, many believed that their positions had changed from being writers to producers, consultants, or gallery curators: subjects felt that they were simply patching or organizing small pieces in tandem rather than coming up with original ideas. Participants saw a change in the extent that they had of their artistic engagement with one another in addition to this change in innovative roles. In sessions without AI, several participants thought they had become more creatively connected with one another. On the other hand, when using AI-producing material, there was little need to carefully study what the other person had written and ponder how to effectively expand upon it. Finally, the artificial intelligence algorithm's inherent limitations may have restricted individuals' creative potential and freedom. Participants recognized they had to write songs that seemed as compatible with the algorithm for machine learning as possible since it had been taught and produced music in traditional genres.

## **5. ANALYSIS**

This chapter comprehensively analyses the profound and multifaceted impacts of AI on the music industry. This involves the rapid transformation that AI has had on various aspects of music creation, consumption, and collaboration, prompting both excitement and apprehension among musicians, creators, as well as listeners. This chapter explores the findings from several studies conducted by different researchers to highlight the evolving landscape of music in the age of AI. This also involves a discussion encompassing the influence of that AI has had on creativity, collaborative dynamics, music taste, and user perceptions, as well as the emerging concept of "technical eclecticism" and the role of AI in song writing.

### **5.1 Impacts of AI on the Music Industry**

To Suh et al. (2021) study, the involvement of AI in music making is seen to impede human creativity. Subjects felt that they were simply patching or organizing small pieces in tandem rather than coming up with original ideas. This is evident when only a few participants claimed to be more open to trying new things and that the pairs with less musical experience were more likely to exhibit this openness to discovering new areas. Suh et al. (2021) discovered that the existence of AI tools also had an impact on the users' creative and collaborative responsibilities in the creation process. Along with this shift in inventive roles, participants noticed a change in the degree of their artistic interaction with one another. Several participants felt they had developed stronger creative bonds with one another during sessions without AI. Contrarily, there was less needed to carefully consider what the other person had written and consider how to successfully expand upon it when utilizing AI to produce content. The inherent restrictions of the artificial intelligence algorithm may have limited people's freedom and creative potential. Participants understood that since the machine learning algorithm had been trained and created music in conventional genres, they needed to write songs that sounded as compatible with it as feasible.



Nowak and Bennett (2020) use the concept of technological eclecticism to demonstrate AI user satisfaction in music consumption. They argue that people consider how every song option influences a certain way of listening to music. This is about how various technologies can help people identify and hone their musical preferences. Diverse materiality and opportunities of technologies, that are viewed as alternatives to enact people's musical preferences, are supported by the type of AI technology one chooses. The expansion of listening alternatives improves people's oversight of their audio settings, which enables them to avoid songs that they do not like. Adopting new technologies is viewed as a complement to established norms. They enable listeners to delve deeper into their musical passions across a range of genres. Members of Generation Y displayed a broad range of musically distinctive consumption patterns. Technology improvements have contributed to increasing Generation Y's awareness of how songs can be located and played, rather than fundamentally changing their view of melodies as an expressive medium. The authors contend that aesthetics, musical genres, materiality, as well as projected subjective reactions that people experience throughout intake procedures, overlap in a person's choice of AI technology. According to Tigre and Maw's (2021) observation, individuals have a generally negative perception of AI tunes, a poor purchasing motive, and a negative credibility for AI performers. The lack of any discernible differences among the participants suggests that knowledge of the use of automation had no impact on how the music was interpreted. Knotts and Collins (2020) also noted that individuals would use an AI technology depending on its affordability and how it can easily adapt to their preferences. Tools like Juke deck, Magenta Workshop, Wekinator, or Logic's MIDI scripiter, which incorporate more quickly into current workflows, were utilized more frequently than others (Knotts and Collins 2020). The bundled software like Alysia and Amper and Aiva had not been used by most responders.

While Suh et al. (2021) noted several advantages of AI acting as a social adhesive, the investigation also discovered several possible drawbacks of AI. Respondents thought that although AI made it easier to work together, it might limit their ability to collaborate deeply. For instance, participants automatically switched towards collectively analysing the AI's outcomes rather than reviewing and directly elaborating on their own thoughts. Some believed they were collaborating as co-producers rather than co-composers. Additionally, the inclusion of AI provided participants with a safe space to collaboratively evaluate another party's creative output. Although this strengthened the bonds

between human collaborators and reduced interpersonal conflict, it is additionally feasible that, if carried too far, AI's position as an outcast external entity could lead to us and Finally, while most pairs believed AI sped up their progress, a minority who had previously been musical professionals believed it also added an extra decision-making burden, particularly when AI content was challenging to regulate. Regarding multi-agent platforms where AI functions as an additional party, developers of collaborative technologies may wish to carefully evaluate these options. According to Knotts and Collins (2020), many study respondents acknowledged that song writing AI had simplified the creation of songs and impacted their musical taste, but the majority disputed that negative impacts including the demise of artists' jobs, standardization of music, and stalling the progress of songs will materialize.

According to Nowak and Bennett (2020), technical eclecticism overlaps components of aesthetics, materiality, and musical genres, including projected affective reactions that people feel throughout intake practices. It is characterized by how people encounter various music formats. AI serves as an agent for advancement as well, making the co-composing activity simpler for users. Some people thought that Artificial Intelligence was particularly helpful for helping individuals get going quickly and gain momentum (Suh et al. 2021). Users perceived that each iteration was sometimes hampered by the need to generate and record ideas starting from scratch given the absence of AI. Several couples thought it was easier to enter collaborative workflows when the technology was present since AI made it feasible to root themselves in previously existing material without the requirement to first organize who was going to be creating which portions. Participants reported that using the AI-generated output as a conversation opener helped them find common ground. It also provided the composition with some initial momentum. However, in the study of user impressions of AI-composed music, Tigre, and Maw (2021) found that individuals had a generally negative assessment of AI songs, a low propensity to buy them, and a negative perception of the credibility of AI-using musicians. The study's findings revealed no significant differences among the different groups, proving that knowing how automation was used had no impact on how people experienced the music.

According to Knotts and Collins (2020), many people who were familiar with song AI's practical applications did not perceive it as an important change in artwork or culture, but rather as merely

an addition to the already existing tools in the field of music. Will as well as tools were frequently used, according to a vocabulary cloud study. This indicated that interviewees frequently discussed artificial intelligence (AI) in the years to come as a term that primarily includes human involvement instead of independent machine inventiveness. This shows that, the majority thought of AI changing the field of music in the future not in terms of being autonomous but rather including human-AI interactions.

## 6. CONCLUSION

AI has significantly changed the way songs are produced, shared, and experienced in the entertainment industry. AI has significantly changed the field of the music business, revolutionizing everything from recommendation engines to song writing and recording. Several advantages of AI have been seen in the music industry. Artists and producers may now explore a wider variety of arrangements styles and sounds through AI-based applications and platforms, which has resulted in more imaginative and diversified music. When using AI, artists find it easy to compose songs using the materials provided by AI as the foundation of their artistic journeys. Music suggestion systems represent a crucial area in which AI is making a substantial impact. Large volumes of data about listeners' interests and habits can be analysed by AI programs to produce customized suggestions for specific users. More precise and relevant suggestions have emerged as a result, assisting consumers in finding fresh music which they are going to appreciate. The availability of more listening options enhances people's control over their audio settings, allowing them to avoid music they don't like. New technologies are considered an addition to customary practices. They make it possible for listeners to dive deeper into the musical categories they love. Instead of substantially altering the perception of tunes as an emotional medium, technological advancements have also increased people's awareness of where and how to perform songs. Additionally, AI offers a mental security net throughout co-composition in addition to shared grounding. A mental safety net, also known as the conviction, that one would not be humiliated or rejected in each situation or job, serves to promote information communication, collaborative learning, and teamwork.

However, despite all these positive impacts, AI has also posed several negative impacts that users have been pointing out. Some individuals have a generally negative perception of AI tunes, a poor purchasing motive, and a negative credibility for AI performers. The involvement of AI in music-making is seen to impede human creativity. The use of AI is simply seen as patching or organizing small pieces in tandem rather than coming up with original ideas. With AI, there is seen to be a change in the degree of artistic interaction between composers. In the presence of AI, artists interact less with one another since there is less needed to consider other people's ideas. Artists

must write materials that are compatible with AI ideas. This in turn restricts the artist's freedom and creative potential. AI has also limited the role of human musicians in terms of the ability to collaborate. Artists automatically switch towards collectively analysing the AI's outcomes rather than reviewing and directly elaborating their own thoughts. With AI, composers are now collaborating as co-producers rather than co-composers. AI has also added an extra decision-making cost, particularly when AI content is challenging to regulate. In as much as AI has simplified the creation of songs and impacted musical taste, negative impacts including the demise of artists' jobs, standardization of music, and stalling the progress of songs will materialize. A homogeneity of music might result from the increased usage of AI in material production and development, where algorithms produce formulaic, repetitive music which lacks uniqueness and innovation. Comparably, there are worries that AI-driven recommendation platforms may prevent individuals from being exposed to a wide variety of difficult music, thus reinforcing current musical tastes and stifling innovation.

Regardless of these reservations, it is obvious that AI has already had a big impact on how the music business will develop in the years to come. It seems conceivable that how music is produced, shared, and enjoyed will undergo significant advancements as AI technology advances. The music sector will face a problem in utilizing AI's potential whilst guaranteeing that it is not detrimental to the novelty, diversity, and innovation that render music a crucial key to our societal legacy.

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## APPENDIX

### Appendix 1: A Summary of the Studies Used in the Research

Study topic	Name(s) of authors	Publication Year	Main Findings	Recommendations	Objectives
A survey on the uptake of Music AI Software.	Knotts, S. and Collins, N.	2020, July.	The survey indicated a future-focused approach to song AI, focusing on the future possibilities for AI technologies rather than their current utility. Experienced programmers were more pessimistic about the status and prospects of AI.	In-depth analysis of music developers' attitudes toward AI and desired creative collaborations with AI technologies	To ascertain the extent to which music artificial intelligence has been adopted among self-selected music technology groups, where relevant background knowledge may be used to forecast the adoption of machine learning and opinions connected thereto.
Artificial intelligence became Beethoven: how do listeners and	Tigre Moura, F. and Maw, C.	2021	People had a generally unfavourable opinion of AI songs, a low purchasing	To further investigate the perception of listeners on AI music.	To gain insight into how music created by AI is perceived by listeners.

music professionals perceive artificially composed music?			motive, and an unfavourable credibility regarding musicians that use AI.		
Music consumption and technological eclecticism	Nowak, R. and Bennett, A.	2020	Young users continue to be perceptive and conscious of the many affordances offered by music technology for music listening and enjoyment. The significance that various musical technology from various eras is given depends greatly on how they are used.	To encourage additional studies on how various listener demographics adopt and utilize music technologies with the aim of better comprehending the relationship between people, technology, and musical content.	To investigate how members of Generation Y, who had been children when digital music innovations were being developed, have embraced, and utilized those novel opportunities while preserving their connection with other technology and media.

<p>Ai as social glue: Uncovering the roles of deep generative ai during social music composition.</p>	<p>Suh, M., Youngblom, E., Terry, M., and Cai, C.J.</p>	<p>2021, May.</p>	<p>AI implicitly establishes a shared foundation at the outset of teamwork, serves as a mental protection net in artistic risk-taking, offers a force over group growth, mitigating relationships stalling and struggle, and changes users' interactive and creative imaginative thinking.</p>	<p>Considering the advantages and disadvantages of human-human cooperation, future technologies could be intentionally designed to support deeper collaborations. Also, to assess the way "human" an artificial intelligence feels.</p>	<p>To comprehend how artificial intelligence might support co-creation.</p>
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