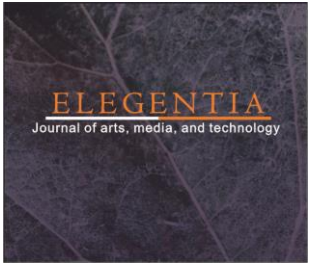
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RESEARCH ARTICLE

Graphic transformation: new expressions of creativity in digital art instruments

A R. Airlangga PH[1], Puja Alviana Dewantri[2], Iskandar[3]

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***Corresponding author:**
A R. Airlangga PH, Universitas Gadjah Mada
E-mail:
ahmadrahmatullahaph@gmail.com

Abstract: The phenomenon of digital art transformation and artificial intelligence (AI) has become a crucial issue in the development of contemporary art, particularly in the context of new creative expressions driven by technological advancements. This issue is essential to study due to its significant impact on the ways art is produced, received, and evaluated in today's digital society. The research aims to examine three key aspects: the visualization of digital artworks, forms of art created through applications, and artworks generated by AI algorithms. The research methodology employs a qualitative approach by investigating the dissemination of graphic images on the internet and social media. Data analysis utilizes descriptive and comparative methods, using case studies of recent digital graphic artworks to understand the transformations taking place. The research findings indicate that digital technology and AI open new avenues in art creation, introduce new aesthetics, and reshape the relationship between creators and their works. The conclusion highlights that the integration of technology presents both challenges and opportunities, with further research needed to explore its long-term impacts on the art industry and creativity.

Keywords: Transformation; Digital Art; Digital Era, Technology, Artificial Intelligence

Abstrak*:* Fenomena transformasi seni digital dan kecerdasan buatan (AI) telah menjadi isu krusial dalam perkembangan seni kontemporer, terutama dalam konteks ekspresi kreativitas baru yang didorong oleh kemajuan teknologi. Isu ini penting untuk dipelajari seiring dengan dampak signifikan pada cara seni diproduksi, diterima, dan dinilai dalam masyarakat digital saat ini. Tujuan penelitian untuk mengkaji tiga aspek penting di antaranya; visualisasi karya seni digital, bentuk karya yang diciptakan melalui aplikasi, dan karya seni yang dihasilkan melalui algoritma AI. Metode penelitian menggunakan pendekatan kualitatif dengan menyelidiki perkembangan penyebaran gambar grafis di internet dan media sosial. Analisis data menggunakan deskriptif dan komparatif dengan studi kasus karya seni digital grafis terkini untuk memahami transformasi yang terjadi. Temuan penelitian menunjukkan bahwa teknologi digital dan AI membuka ruang baru dalam kreasi seni, memperkenalkan estetika baru, dan mengubah hubungan antara kreator dan karya. Kesimpulan penelitian menunjukkan integrasi teknologi telah menghadirkan tantangan dan peluang, dan penelitian lebih lanjut diperlukan untuk mengeksplorasi dampak jangka panjangnya terhadap industri seni dan kreativitas.

Keywords: Transformasi; Seni Digital; Era Digital, Teknologi, Kecerdasan Buatan

About Author
AR. Airlangga PH, Universitas Gadjah Mada, Yogyakarta, Indonesia; Puja Alviana Dewantri, Universitas Gadjah Mada, Yogyakarta, Indonesia; Iskandar, Institut Seni Budaya Indonesia Aceh; Indonesia

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1. Introduction

The transformation of digital art and artificial intelligence (AI) in the digital era has created a new phenomenon in creative expression, making it essential to study due to its increasingly widespread impact on the world of art and culture. Digital art enables artists to explore new forms previously inaccessible through traditional media, while AI provides the capability to produce works that blend human and machine elements (Wiratno & Callula, 2024). This phenomenon also affects the accessibility of art, as technology opens opportunities for more individuals to participate in the creation process, even without extensive technical skills (Cetinic & She, 2022). Therefore, it is crucial to examine these changes to understand how digital art and AI are reshaping our perception of creativity, as well as the potential and challenges they bring to the future of art.

So far, numerous studies have discussed digital art and AI, yet there are notable gaps in the existing literature, indicating the need for further research. Most studies tend to focus on technical aspects, such as algorithms or software, without deeply exploring the social, cultural, and philosophical dimensions of this transformation in digital art (Cardinali, 2019). Additionally, many analyses overlook the audience's role in evaluating and interpreting AI-based artworks, resulting in a lack of comprehensive understanding of how such art is received or perceived by society (Oksanen et al., 2023). Existing literature also rarely addresses the ethical implications of human-machine collaboration in art, such as issues of originality or copyright for AI-generated works (Zylinska, 2023). These gaps highlight the necessity to explore digital art and AI from broader perspectives, beyond technology, to understand their impact within a more holistic social and cultural context.

The purpose of this research is to complement the shortcomings of previous studies that have not taken a comprehensive look at the transformation and development of digital art in utilizing technology, as well as its long-term impact on the definition of creativity and contemporary art. This research aims to answer three main questions: (1) how the visualization of digital artworks utilizes creative software; (2) how artworks produced through vector art applications, which offer advantages in scale and visual clarity; and (3) how artworks created with artificial intelligence (AI) algorithms, which revolutionize the concept of originality and human-machine collaboration. By answering these three questions, this research can provide a deeper and more comprehensive understanding of the transformation of digital art and AI as new expressions of creativity in the digital age, while enriching the literature on the relationship between art, technology and innovation.

The argument presented in this paper is that the transformation of digital art and artificial intelligence (AI) not only expands the technical boundaries of artistic creation but also influences how art is produced, appreciated, and interpreted by society. The visualization of digital artworks generated through creative software demonstrates new levels of flexibility and complexity that are challenging to achieve through traditional methods. Similarly, vector art-based works offer a precise and scalable aesthetic that conventional media have yet to fully explore. Meanwhile, art created using AI algorithms introduces a new form of collaboration between humans and machines, simultaneously blurring the lines between human originality and machine creativity. The primary hypothesis tested is that these technological advancements are creating a new paradigm in the art world, demanding a reassessment of the concepts of creativity, originality, and ethics in art. This study seeks to examine the extent to which these transformations impact the contemporary art landscape on a global scale.

2. Literature Review

2.1. Transformation

Transformation is a process of change that involves shifts in systems, patterns, and structures for specific purposes. Hilbert (2020), in his study, stated that along with the development of digital technology, transformation is not merely a technical change but also encompasses social, cultural, and economic aspects. In line with this, transformations occurring alongside digital advancements are evident in the art sector (Kraus et al., 2021). Digital transformation in the arts has revolutionized the way artists produce and distribute their works through online platforms (Rani, 2018). This has resulted in a broader audience

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reach without geographical limitations (Rose, 2016). Transformation enables the integration of artificial intelligence (AI) technology into the art-making process (Cetinic & She, 2022). Generative algorithms can provide inspiration for artists in creating artworks (Epstein et al., 2023). Thus, transformation in the digital era has the potential to drive innovation and empower artists.

Several studies have mapped the factors driving transformation. Key drivers of transformation in the digital era include technological advancements, the demands of globalization, and shifting societal trends. Technological advancements, such as artificial intelligence, have created ecosystems that enable transformation across various sectors, including digital arts (Feola, 2015; Henning, 2020). Globalization, on the other hand, fosters interconnectedness among individuals and institutions, spurring the adoption of technology to maintain competitiveness and relevance (Fatima, 2017; Skare & Riberio Soriano, 2021). Moreover, increasingly dynamic societal trends emphasizing innovation, efficiency, and personalized experiences serve as major catalysts for transformation (Appio et al., 2021). In the realm of digital arts, audiences now demand immersive and interactive visual experiences, which can only be realized through the integration of advanced technologies (Soto-Martin et al., 2020). The factors outlined above collectively underscore the drivers of transformation.

2.2. Digital Art

Various forms of transformation have occurred in digital art. Digital art is a form of creative work produced using digital technology in the creation and presentation of artworks (Baca et al., 2019). A study by Cui (2017) mentions that digital technology has become inseparable from the artistic process. Digital art allows for the creation of artworks using generative art, which cannot be achieved through traditional methods (Galanter, 2016). In line with this, digital art offers access to create interactive works such as augmented reality that involve active participation from the audience (Panciroli et al., 2023). Digital art plays a role in creating inclusive spaces, making artworks accessible without the constraints of space and time through digital platforms (Khaire, 2015). Thus, digital art has become widely used in creative spaces in the modern era.

Several studies have mapped the characteristics of digital art. These characteristics include medium flexibility, technology integration, and global accessibility. The flexible nature of digital art is demonstrated by its ability to exist in various formats (Almutawa, 2021; Ivancic et al., 2016). In line with this, digital art has already incorporated advanced technologies, such as design software, AI algorithms, or virtual reality, as core elements of its creative process (Mazzone & Elgammal, 2019; Ragot et al., 2020). The final characteristic, global accessibility, allows digital artworks to be distributed via the internet, reaching audiences without geographic boundaries while also opening spaces for cross-cultural dialogue (Khaire, 2015). The above description represents the characteristics of digital art as mapped in studies.

2.3. Digital era

The transformation in digital and AI art occurs in the digital age. The digital age is a period of global transformation marked by the dominance of information and communication technology in every aspect (Barrett et al., 2015). A study by Qi et al. (2021) mentions that digital technology has become a primary tool in the creation, distribution, and consumption of information. The digital era facilitates global connectivity through online platforms, enabling cross-border collaboration in various fields, including art (Timmis et al., 2016). This era accelerates creative innovation, such as the use of AI in art to create works that blur the boundaries between humans and machines (Anantrasirichai & Bull, 2022). In line with this, the digital era also supports the democratization of knowledge through easier and more open access to information (Mohammad Muqtader Yousafzai, 2023). In the context of art, the digital era creates a new ecosystem where works can be created, displayed, and consumed virtually.

The characteristics of the digital era include the speed of information access, unlimited connectivity, and the integration of technology into daily life (Jones, 2015). The speed of access allows information to be obtained instantly, which affects the way people work, learn, and create (Hodge & Ratten, 2015; Paz-Baruch et al., 2014). Unlimited connectivity creates a global network that enables cross-cultural and interdisciplinary collaboration (Adler & Aycan, 2018; Yang et al., 2014). Meanwhile, the integration of technologies such as AI, big data, and IoT has transformed the way humans interact with the world, including in the realm of art, where technology has become an inseparable part of the creative process and the distribution of works (Anantrasirichai & Bull, 2022). The above description outlines the characteristics of the digital era.

3. Method

This study focuses on the transformation of art in the digital and AI era as the primary unit of analysis, highlighting changes in the creative process, aesthetics, art education, and the philosophical values of art. The research employs a qualitative approach with a case study design to explore the impact of digitalization on art. This approach is chosen because it allows for an in-depth exploration of digital discourse and artistic practices within the ever-evolving global context. Case studies are used to understand patterns of interaction between technology and art through the observation of specific phenomena, such as the use of AI in art or the adoption of global aesthetics. Additionally, online observations are conducted to map the evolving discourse on social media platforms, particularly Instagram and TikTok, which have become primary spaces for artists to present their work. With this design, the research aims to identify relevant trends and patterns to address the research questions. The research process involves data collection and interpretation of results to gain a deep understanding of this phenomenon.

More specifically, various images created using graphic design software tools, vector applications, and AI are collected from several related sources that have been published or exhibited online. The digital artworks produced with programs such as Adobe Photoshop and Procreate, vector illustrations created with programs like Adobe Illustrator and Corel Draw, and AI-generated art produced with technologies such as Generative Adversarial Networks (GAN) and other AI algorithms are some examples of the artworks examined. Subsequently, the art data is categorized according to the visual patterns observed in the artworks and the instruments used.

The findings of the analysis are then presented in a table that shows the visual representation of graphic design artworks for each category, along with a comprehensive explanation of the unique qualities of each piece. A table explaining digital artworks based on graphic design software, vector applications, and AI is included in the table. The data are analyzed using a qualitative interpretation approach, which involves three main stages: restatement, description, and interpretation. Restatement is performed to identify the main themes in the data, such as the homogenization of aesthetics and the depersonalization of the creative process (Ruiz Fabri, 2021). Description is used to identify patterns in the data, for example, how social media algorithms shape artistic trends (Mölder et al., 2021). Interpretation is used to provide meaning to the data, particularly in the structural and cultural context of digital art (Rahaman, 2018). This analysis also aims to identify the underlying ideologies of art homogenization, such as the dominance of commercialization on digital platforms. With this approach, the research can reveal the implications of digitization on both traditional and global graphic art.

4. Result

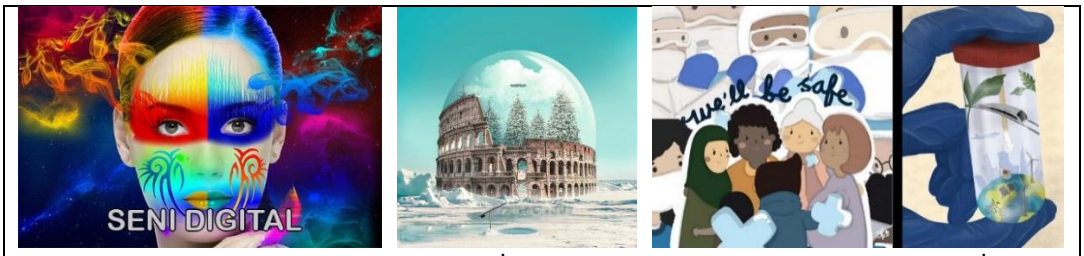
4.1. The digital artwork is created using software

Digital artworks created with the help of software such as Adobe Photoshop, Corel Draw, and Procreate have become an integral part of contemporary art development. The use of these software tools allows artists to explore new dimensions in technique and expression, offering greater flexibility in terms of color processing, texture, and composition. For example, digital art enables the creation of highly detailed images that are difficult to

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achieve with traditional techniques, as seen in the digital works of artists who combine elements of reality and imagination. With these tools, artists can also easily edit and modify their works without physical limitations, opening up opportunities for freer experimentation. Thus, digital software has redefined the boundaries of art, allowing for the creation of works with a higher level of creative freedom, while enriching artistic expression in the digital era. The following sections illustrate forms of digital art (Table 1).

Table 1. Visualization of Digital Artworks



a b c d

Source: Digital media research data

Data Table 1 illustrates three forms of art created with digital touches, namely: (a) Digital Art Visualization, created with digital technology or presented through digital technology. This includes images that are entirely the result of computer editing or images created using software programs such as Adobe Illustrator, Corel Draw, and other applications. (b) A Digital Painting of the Roman Colosseum that appears as if taken by a camera, created by Zak Eazy. Eazy also incorporates other beautiful elements, such as depicting it during winter. (c) A Digital Painting by Two Indonesian Scientists Displayed at UNESCO Headquarters. Saskia's work, titled 'Beyond VTM,' is a digital painting showing a Viral Transport Media (VTM) bottle used for swab sample collection by healthcare or laboratory personnel. The environment inside the bottle reveals Saskia's hopes and vision after the pandemic and how the world can be transformed with renewable energy sources and eco-friendly transportation systems. Saskia's work serves as a reminder that a better world awaits after the pandemic. (d) Ratih's work, titled 'Safe,' is inspired by Sarah Gilbert, one of the lead researchers working on the Covid-19 vaccine. Ratih created this artwork as a tribute to all researchers, scientists, and laboratory workers worldwide who have worked behind the scenes to develop the vaccine.

Overall, the data in the table shows the diversity of digital art as a form of visual expression generated through modern technology. Three patterns can be identified: First, Humanistic Narratives. Most of these digital artworks not only focus on visual beauty but also convey humanistic messages, such as honoring scientists or expressing hopes for a post-pandemic world. Second, the Integration of Reality and Imagination. Technology allows artists to blend real elements with imaginative ones. Third, the Use of Art as a Medium for Social and Scientific Reflection. Thus, digital art not only serves as a tool for creative expression but also reflects the social, cultural, and scientific dynamics evolving in the era of modern technology.

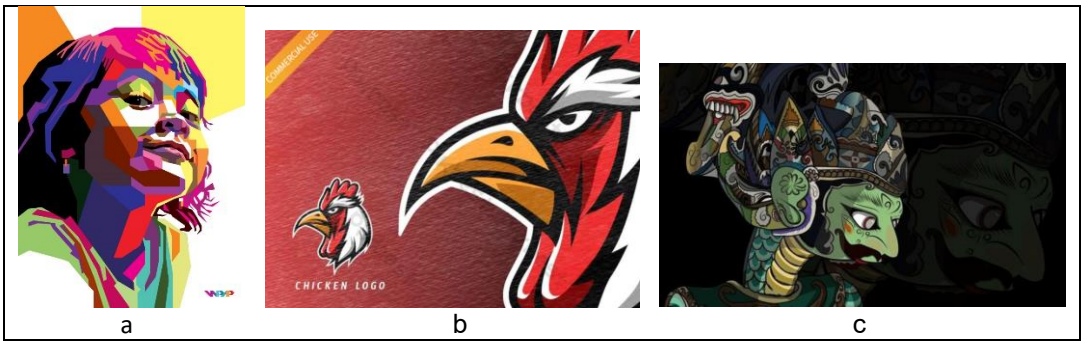
4.2. Artworks Using Vector Art Applications

Art created through the application of vector art, such as Adobe Illustrator and Corel Draw, offers a unique approach to creating high-quality and versatile images. By using a vector-based system, artists can produce works that remain sharp and clear, even when enlarged or reduced—an important advantage over pixel-based images. For example, logo designs, cartoon illustrations, and digital graphics are often created with these applications, allowing visual elements such as lines, shapes, and colors to be combined with precision. With the ability to generate images that can be customized and edited without losing quality, vector-based art opens up significant opportunities for graphic designers and artists to create works that are flexible and adaptable across various media. Therefore, vector art applications

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not only simplify the design process but also expand the potential for visual expression in the digital art world. This is detailed as follows (Table 2).

Table 2. Visualization of Artwork with Vector Art Applications



a b c

Source: Digital media research data

Data Table 2 illustrates the forms of artwork created with application touches, including: (a) Wedha, originally from Indonesia, created his artwork on traditional media in the early 1990s, which later, in the early 2000s, transitioned into the digital realm. Vector became the natural choice for a colorful geometric style. Since then, his work has gained significant popularity in Indonesia, with several communities dedicating themselves to creating and presenting portrait images in the WPAP style, with membership reaching thousands! With the rise of geometric trends, it is fair to say that WPAP has expanded beyond its Indonesian roots and is increasingly seen as a design approach. (b) Graphic Elements of the Red Roasted Chicken Mascot Esport Logo, (c) Traditional Wayang Character Design. This first design draws inspiration from the traditional Indonesian character of wayang. The character undergoes modifications in color and additional details, such as snake-like scales on the neck and decorative head elements. This is a fairly interesting strategy to imitate: adding a modern touch to a design that is originally traditional. Designs like this will have a very strong character and be easier to remember because of their unique qualities.

Data in Table 2 reveals how art with the touch of digital applications has transformed traditional approaches and created new forms in visual art. Three patterns are identified as follows: first, Transformation from Tradition to Digital: this transformation creates a new style while still respecting its cultural roots. Second, Contextualization of Local Art to the Global Stage. Third, the Integration of Tradition and Modernity. Thus, this data demonstrates how digital art not only revolutionizes techniques and styles but also bridges tradition with innovation, expanding the influence of local art to the global stage, and creating harmony between cultural values and the progress of time.

4.3. Artwork Created with AI Algorithms

Artworks created using AI algorithms have brought a revolution in the creative world, introducing new ways to create and understand art. With the ability to analyze data, recognize patterns, and generate visuals, AI enables the creation of works that are not only aesthetic but also innovative. One example is the use of Generative Adversarial Networks (GANs), which can create realistic human faces or abstract works with incredible precision. Additionally, AI algorithms like DeepDream have been used to create images that combine surreal elements with intricate details. This technology provides opportunities for artists to explore ideas that were previously difficult to realize, as well as expand the traditional boundaries of art. Therefore, AI-based art not only serves as a creative tool but also as a means to explore unlimited possibilities in modern art. The following section displays artworks created with AI algorithms (Table 3).

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Table 3. Visualization of AI-Based Artworks



a b c

Source: Digital media research data

Data Table 3 illustrates forms of artwork created using AI algorithms, which include: (a) In 2018, the collective Obvious Paris used generative AI to create a portrait of Edmond de Belamy, a fictional character they created. They used open-source algorithms and trained it with 15,000 portraits from the 14th to the 19th centuries. This artwork became famous when it became the first AI-generated art piece to be auctioned at Christie's, New York. The painting sold for $432,500 at the auction. (b) There are hundreds of thousands, even millions, of photos attempting to capture the winter atmosphere of New York City. This has been romanticized in films, music, television, and more. However, this Reddit user found a simple yet striking way to represent the classic winter scene of the Big Apple using AI. The layers, depth, and small details (including falling snowflakes) create a captivating effect in a fairly common image. The user applied a visual treatment reminiscent of old video games to make the AI-generated artwork look both antique and highly modern. (c) Post-apocalyptic robot. A Midjourney user envisioned a post-apocalyptic world with rusted robots interacting with flowers in a sandy urban landscape. This model accurately interpreted the AI art prompt, adding yellow clouds, walls filled with graffiti, and more. The AI's ability to develop AI-generated art with meticulous design is a game-changer for prototyping. Imagine an aspiring Hollywood screenwriter creating their own moodboard and storyboard for a more effective presentation.

Overall, Data Table 3 shows that AI-based art has successfully merged aesthetic traditions, modern interpretation, and technological innovation, creating new opportunities in the world of art and design. Three patterns identified include: first, the integration of tradition and technology; second, the exploration of new narratives and emotions; and third, a revolution in art prototypes. Thus, AI-based art not only changes the way we view and create artwork, but also paves the way for creative breakthroughs that integrate the past, present, and future in the world of art and design.

5. Discussion

This study explores various forms of digital art created through modern technology, such as software-based artwork, vector art applications, and AI algorithms. The findings reveal that digital art has brought significant transformation in the processes of creation, aesthetics, and message delivery. Software allows for high flexibility in visual manipulation, vector art applications support works with precision and scalability, while AI algorithms open opportunities for unlimited visual exploration, both in realistic and abstract forms. The research also highlights the diversity of digital art in conveying narratives, blending tradition and innovation, and creating revolutionary visual prototypes. Therefore, this study affirms that digital art not only expands the horizon of creativity but also serves as a medium for social reflection and exploration of modern, continuously evolving aesthetics.

Digital artwork created using software not only represents a shift in creative techniques but also influences the way we understand and appreciate art itself. The use of software such as Adobe Photoshop or Corel Draw allows artists to explore new dimensions in color, texture, and composition, providing greater creative freedom compared to traditional techniques. This aligns with Zaidel (2018), who argues that art is no longer bound to specific

materials but instead focuses on experimentation and the innovation of new forms. In this context, technology plays a role as a tool to transcend the limitations of tradition, enabling artists to create works with more precise visual quality that are easier to modify (Gera, 2013). The implication of this development is the creation of new possibilities in the art world, where software acts not only as a tool but as a form of creative expression itself (Diggs et al., 2015). Thus, digital art opens up space for collaboration between technology and creativity, giving rise to more dynamic and open forms of art.

Artworks created with AI algorithms are establishing a new paradigm in the art world by presenting visual possibilities that cannot be achieved by human capability alone. Algorithms such as Generative Adversarial Networks (GANs) enable the creation of realistic or abstract images through data analysis and pattern recognition, revolutionizing the way art is produced and received (Porkodi et al., 2023). According to Anantrasirichai & Bull (2022), AI has the capacity to facilitate exploratory creativity, where machines are not just tools but also collaborative partners in the creation process. This explains why AI-based art is increasingly used to bridge aesthetic traditions with modern technology. The implication is that AI-based art not only challenges the definition of traditional art but also broadens the scope of creative expression through the exploration of new narratives and emotions. As a result, AI algorithms shift the role of the artist from creator to curator, who selects, refines, and interprets the work produced by machines, opening a new chapter in the relationship between art, technology, and creativity.

This study shows that digital art created through software, vector art, and AI algorithms expands the definition of art in a modern context, in line with previous findings that emphasize the role of technology in updating traditional art practices (Miss et al., 2021). The similarity is that both this study and previous research underline how technology enables artists to create works with greater flexibility and higher levels of detail. However, the difference lies in the focus of exploration: previous research focused more on the transition from traditional media to digital, whereas this study emphasizes the integration of AI algorithms as a creative partner in producing new forms of art that involve artificial intelligence (Drucker, 2013). Thus, this study demonstrates novelty through the exploration of the potential of AI algorithms that go beyond being mere tools, positioning them as active participants in the process of creating modern art.

Based on the research findings, the strategic steps that need to be taken are to encourage the integration of digital art and AI technology in art education, the creative industry, and national cultural policies. The government and educational institutions can develop specialized curricula that teach software-based art skills, vector art, and AI algorithms to enhance the capacity of future artists. In the industrial sector, training and funding should focus on the development of AI technology applications in art to create new economic opportunities. Additionally, cultural policies should support the recognition of digital art through exhibitions, competitions, and incentives for artists who innovate in this field. By supporting technological infrastructure and accessibility, these actions will not only improve the quality of digital art but also strengthen the position of art and culture in facing global challenges, creating an inclusive and sustainable creative ecosystem.

6. Conclusion

The most significant finding of this research is that digital technology, including art software and AI algorithms, has opened new horizons in the art creation process that transcend traditional boundaries. The key takeaway is that art is no longer merely a reflection of the artist's manual skills, but also the result of a creative collaboration between humans and technology. The experience gained from this research demonstrates that the adoption of technology in art can expand the very definition of art itself, allowing for the exploration of new aesthetics that were previously difficult to reach. Moreover, this research teaches that innovation in digital art can serve as a catalyst for the development of cross-disciplinary creativity, creating a space for dialogue among artists, scientists, and technologists. Ultimately, this research underscores the importance of adaptation and continuous learning in facing the changes of the times, as well as how art can be a dynamic medium for bridging

tradition and innovation to create works that are relevant to the needs and expectations of the future.

The strength of this research lies in its contribution to the development of knowledge in digital art, particularly in understanding the integration of technology and art through software and AI algorithms. This study enriches empirical data on the application of digital art software such as Adobe Illustrator or Corel Draw, as well as AI technologies like Generative Adversarial Networks (GANs), by providing an in-depth analysis of how these tools are used to create innovative artworks. Conceptually, this research introduces a novel approach that combines digital creativity theory with traditional aesthetics, demonstrating how technology can expand the boundaries of art. The approach used also opens the door to new questions, such as the extent to which the interaction between humans and machines in the creative process can be considered true collaboration, or how these technologies impact the value and meaning of art in society. Thus, this research not only offers new insights but also sparks further discussions in the fields of art, technology, and culture.

The limitations of this study lie in its scope, which focuses primarily on the application of digital art based on software and AI algorithms without conducting an in-depth exploration of the perspectives of the audience or recipients of the artwork. This study also has not explored the psychological or social impacts of using this technology in art, such as public perceptions of AI-based art compared to traditional art. Furthermore, the approach used is largely qualitative, thus quantitative data is still needed to measure the level of acceptance, understanding, or engagement of the public with digital artworks. This study is also limited to the application of established technologies, while new technological developments, such as more advanced generative AI or augmented reality (AR), have not been included. Future research could expand this scope to create a more comprehensive understanding of the role of technology in art and culture.

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