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THE INFLUENCE OF COMPUTERS ON CREATIVE INDUSTRIES AND THE DEVELOPMENT OF DIGITAL ART

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Abstract

Computers have revolutionised the creative industry and digital art by introducing sophisticated software and hardware, such as Adobe Creative Suite and graphic tablets, which allow artists to create works of high quality and incredible detail. New technologies such as virtual reality (VR) and augmented reality (AR) have transformed the interaction between artists and artworks, enabling creation in three-dimensional spaces and more immersive interactive experiences. In addition, networking and cloud technologies facilitate global collaboration and efficiency in art production, while innovations such as blockchain and NFTs offer new ways to distribute and protect digital artworks. This combination of advanced tools, technologies and educational resources is fuelling rapid growth and transformation in the digital art world.
Keywords: Computers, Creative Industries, Digital Art Development.

Introduction

In the last few decades, computers and digital technology have transformed many aspects of human life, including the creative and art industries. This transformation has had a significant impact on the way artists work and how artworks are appreciated by the public. Computer technology not only offers new tools for digital artists, but also opens up new opportunities in the creative industry as a whole.

The creative industry is an economic sector that focuses on the creation and exploitation of intellectual property. It encompasses areas such as advertising, design, publishing, music, film, fashion and fine arts. The basis of the creative industries is the process of creativity that creates economic and cultural value (Skublewska-Paszkowska et al., 2022). In modern times, the creative industries are growing along with the advancement of technology and the internet, which allows the distribution of creative works more widely and efficiently. The rapid development of information and communication technology has brought the creative industries into the digital age,

opening up new opportunities for creators to reach a global audience and manage their copyrights more effectively (Javed et al., 2022).

Digital art, as part of the creative industries, refers to artworks created or presented through digital technology. Digital artists use computer software, graphics tablets, and various other technologies to produce works that can be images, videos, animations, or interactive installations. Digital artworks can be rapidly disseminated through the internet and social media, making them more accessible to a wider audience (Brauner et al., 2022). With platforms such as Instagram, Behance, and NFT marketplaces, digital artists now have greater opportunities to market their work and gain global recognition. In addition, digital art also enables collaboration between artists from different parts of the world, enriching innovation and creativity in this field (Banks & O'Connor, 2021).

The development of computer technology has led to the emergence of various platforms and software that aid the creation of digital art, such as Adobe Creative Suite, CorelDRAW, and 3D animation software such as Blender and Maya. In addition, social media and sharing platforms such as Instagram, DeviantArt, and Behance allow digital artworks to be accessed by a global audience. According to a report from Statista, by 2022, the digital art market is expected to reach a value of billions of dollars, with increasing interest in NFTs (Non-Fungible Tokens) as one of the indicators (Kohli et al., 2022).

However, the adoption of computer technology in the digital arts and creative industries is not without its challenges. Some of the issues that arise include gaps in access to technology, the need for new skills, and copyright issues in the digital age. In addition, there are concerns that the speed of technology may erode the traditional aesthetic values and direct visual experience offered by conventional fine art (Yin et al., 2023).

Furthermore, the influence of technology, especially computers, is very significant in various fields, ranging from economics, education, to health. In economics, computers have automated many processes that previously required human labour, such as inventory management, data analysis and financial transactions (Ning & Fu, 2024). These technologies enable higher efficiency, reduced operational costs, and increased productivity. In the world of commerce, e-commerce and computer-based digital marketplaces have opened up opportunities for small to large businesses to reach global consumers. In addition, computers also play an important role in improving the quality of customer service through the use of chatbots, consumer data analysis, and service automation (Ometov et al., 2021).

In education, computers have revolutionised teaching and learning. Access to information has become easier thanks to the internet and educational software, which allows students to learn from anywhere at any time. Virtual classrooms and e-learning platforms such as Coursera, Khan Academy, and EdX provide a wide range of courses

that can be accessed by anyone with an internet connection (Oppenlaender, 2022). Meanwhile, in healthcare, computers are used for hospital information system management, artificial intelligence-based medical diagnosis, and the development of telemedicine that allows doctor consultations to be conducted online. With computer technology, diagnosis and treatment can be carried out more quickly and accurately, and support medical research to find new treatments (Radanliev et al., 2024).

Thus, this research will focus on the impact of computer use in the creative industry and the development of digital art among artists and creative companies in Indonesia. Aspects that will be discussed include the influence of technology on the creative process, access and adoption of technology by creative industry players, and the challenges and opportunities that arise.

Research Methods

The study in this research uses literature. The literature research method is the process of collecting and analysing pre-existing information from various sources, such as books, journal articles, conference papers, and online sources, to gain an in-depth understanding of a particular research topic or problem. This research begins with the identification and selection of relevant and credible literature, followed by a critical reading and synthesis of the information found. The purpose of this method is to identify gaps in knowledge, support or reject existing theories, and provide a theoretical framework or context for future research. In addition, literature research is also important to ensure that researchers are not repeating studies that have already been done, but rather contributing to expanding knowledge in the field. (Arikunto;, 2000); (Fadli, 2021).

Results and Discussion

The Role of Computers in the Creative Industry

Creative industries are economic sectors that focus on the creation and commercialisation of products and services derived from the creativity, skills, and talents of individuals or groups. These industries include areas such as art, design, music, film, advertising, architecture, publishing, performing arts, fashion, video games, and digital media (Powell et al., 2022). A key characteristic of creative industries is the use of innovative and original elements that not only generate economic value but also contribute significantly to cultural and social identity. With technological empowerment and global access, creative industries are able to drive economic growth, create jobs, and push the development of local cultures to the international arena (Jiang et al., 2023).

Computers play a central role in the creative industries, from the conceptualisation stage, production to distribution of creative works. In the field of graphic design, computers enable designers to create complex and detailed visual

works using software such as Adobe Photoshop, Illustrator, and CorelDRAW (Gill et al., 2022). The ability to edit, modify and render images digitally speeds up the design process and allows for more precise results. In addition, computers also play a crucial role in animation and visual effects, where techniques such as CGI (Computer-Generated Imagery) make it possible to create fantastic scenes that would be impossible to realise physically (Gong, 2021).

In the music industry, computers have also had a significant impact. Music production now makes extensive use of digital audio workstation (DAW) software such as Ableton Live, FL Studio, and Pro Tools. These allow musicians to record, edit and mix music tracks, as well as add complex sound effects with ease. Advances in computing technology have also enabled the emergence of digital musical instruments and synthesizers, giving musicians more options in creating and experimenting with sound. Digital storage and distribution of music through platforms such as Spotify and Apple Music are also possible thanks to the development of computer technology, which allows music to reach a global audience quickly (Stokes, 2021).

In the world of publishing and media, computers have changed the way written material is written, edited and distributed. With word processing software such as Microsoft Word and Google Docs, writers and editors can easily produce, proofread and organise their manuscripts. The layout design of magazines, newspapers and books is now also done digitally using programmes such as Adobe InDesign, which makes it easy to organise visual elements and text to make them more attractive and professional. In addition, the digital age enables online publication of works through blogs, e-books and websites, where computers act as the main tool in content management and distribution (Audry, 2021).

Finally, in the video game and interactive multimedia industries, computers are the main platform where the entire development process takes place. From initial concept creation to programming, graphic design, animation, testing, and finally distribution, everything takes place with the help of computers (Anantrasirichai & Bull, 2022). Game development software such as Unity and Unreal Engine provide the necessary tools to create realistic and interactive three-dimensional environments. Computers also enable global collaboration among game development teams, who can work together from different parts of the world. Thus, computers not only enable boundless creativity, but also connect creators with audiences directly, opening up new spaces for innovation and creative expression (Santos et al., 2021).

Digital Art Development

Digital art is a form of artistic expression that uses digital technology as its primary medium. It encompasses a wide range of creative practices such as digital illustration, animation, digital fine art, photo manipulation, and multimedia installations. Digital artists utilise computer software and hardware to create works of art that are

often difficult or impossible to do with traditional methods. Advances in technologies such as computer graphics, image editing software and 3D modelling tools have expanded creative possibilities and enabled artists to explore innovative concepts and techniques, bringing together art and technology in unique and dynamic ways (Huang et al., 2021).

The evolution of digital art began in the second half of the 20th century with the advent of computers and graphics software. At first, artists used computers for simple tasks such as drawing geometric shapes and processing black and white images. In the 1960s and 1970s, pioneers such as Frieder Nake and Harold Cohen created the first computer-generated artworks. The technology at that time was limited, but it enabled early explorations of how algorithms and computer programmes could produce new and exciting visual art (Choi & Kim, 2021).

In the 1980s and 1990s, advances in computer technology, such as increased processing capabilities and the development of graphics software such as Adobe Photoshop and CorelDRAW, greatly expanded the scope of digital art. Artists began to combine digital techniques with traditional methods, resulting in rich and complex artworks (Ni et al., 2023). This era also saw the birth of video games and computer animation, which opened up new opportunities for creativity and artistic expression. Digital artists such as David Hockney began to master digital tools to create artworks that were widely recognised in the art world (Nagy & Lăzăroiu, 2022).

In the 21st century, digital art has become an integral part of the contemporary art world. Improvements in internet technology and social media have enabled the global and instant dissemination of digital artworks. Artists now have access to highly advanced tools such as 3D software, virtual reality (VR), and augmented reality (AR), which expand the traditional boundaries of art media (Guo et al., 2021). Platforms such as Instagram, DeviantArt, and Behance give artists the opportunity to showcase their work to a wider audience. Digital art is also finding its place in the formal art market, with works being sold in digital galleries and auctions, signalling the full recognition of digital art as a legitimate and valuable art form (Szeliski, 2022).

Today, digital art continues to evolve rapidly thanks to the emergence of new and innovative technologies. Blockchain and Non-Fungible Tokens (NFTs) have revolutionised the way artists sell and distribute their artwork. While previously digital artists often faced challenges in valuing the authenticity and ownership of their works in the digital world, NFT technology provides a solution by providing an indisputable certificate of ownership on top of the blockchain. NFTs allow digital artists to sell their works as unique assets and collect royalties whenever the works are traded (Betzler et al., 2021).

In addition, the development of artificial intelligence (AI) has opened up a new dimension in digital art. Some artists use AI algorithms to assist in the creative process, resulting in artworks that are partially or fully machine-generated. An example is

artwork produced by GANs (Generative Adversarial Networks), which are capable of creating highly realistic images that are sometimes difficult to distinguish from those created by humans. This has led to debate and reflection on the role of human versus machine creativity in creating art (Henriksen et al., 2021).

VR and AR technologies are also growing in popularity in digital art, creating interactive and immersive experiences. Art exhibitions that utilise VR allow viewers to 'enter' the artwork and interact with elements within it in ways that are not possible in traditional art. AR allows artists to add digital layers to the real world, creating a unique collaboration between physical and digital spaces. With all these innovations, digital art is constantly evolving and challenging the boundaries of what is possible, making it a dynamic and always exciting field to follow (Henriksen et al., 2021).

The computer technology used in digital art encompasses a diverse range of software and hardware. As technology evolves, digital artists have access to increasingly sophisticated and innovative tools to create artworks. Graphics software programmes such as the Adobe Creative Suite (including Photoshop, Illustrator, and After Effects) are some of the most commonly used. Photoshop, for example, allows for highly detailed image editing, photo manipulation, and the creation of digital artworks from scratch (Walker, 2023). Illustrator, on the other hand, focuses more on vector graphics, which is ideal for logo design and illustrations that require high scalability without losing quality. After Effects is used for animation and visual effects, giving artists the ability to create dynamic projects with complex movements (Franceschet et al., 2021).

In addition to the Adobe suite, there are also other software often used in digital art. CorelDRAW is a popular alternative to Adobe Illustrator, known for its capabilities in vector illustration and graphic design. Blender is a very powerful open-source software for the creation of 3D models, animations, and visual effects, suitable for artists working in a three-dimensional medium. Procreate is a very popular app among digital artists using the iPad, offering intuitive and responsive drawing tools that support professional-grade styluses like the Apple Pencil. This software allows artists to draw and paint digitally with great ease and flexibility (Nuccio & Bertacchini, 2023).

In terms of hardware, a high-specification computer or workstation is essential to handle the heavy workload of complex design and animation software. Computers with powerful processors, plenty of RAM (at least 16GB for most heavy work), and graphics cards that support fast and efficient 3D rendering are necessary (Castellano & Vessio, 2021). Desktops such as the Apple iMac Pro or various workstations from HP and Dell are often the top choices due to their exceptional processor power and graphics capabilities. For artists who focus on mobility, laptops such as the MacBook Pro or Dell XPS Series are often chosen for their combination of portability and robust processing power (Rezwana & Maher, 2023).

Input and output tools are also an important aspect of digital art. Graphic tablets from Wacom, Huion, or XP-Pen allow artists to draw manually with a stylus, which greatly improves precision and comfort compared to using a mouse. Monitors with high resolution and good colour accuracy, such as those offered by EIZO or BenQ brands, help artists see their work in crystal clear detail and accurate colours. High-quality printers can also be used to produce digital art prints that retain the quality and beauty of the original. With the combination of advanced software and versatile hardware, digital artists can create impressive artworks, pushing the boundaries of their creativity to new levels (Lee et al., 2021).

Besides standard hardware and software, there are also other computer technologies that are gaining popularity among digital artists, such as virtual reality (VR) and augmented reality (AR). VR devices such as Oculus Rift and HTC Vive allow artists to work in three-dimensional space in real time, providing new ways to interact with their artwork (Laakso et al., 2021). Software such as Google's Tilt Brush allows artists to paint in an immersive three-dimensional space, opening up creative possibilities that were previously impossible. Augmented reality using devices such as Microsoft's HoloLens is also starting to be used to create interactive and integrative experiences that combine digital art with the real world. This adds a new dimension to how art can be experienced and produced (Nalbant & Aydın, 2023).

The role of networking and cloud technologies is also increasingly important in digital art. Services such as Adobe Creative Cloud enable easier collaboration between artists located in different places, with access to project files and resources that can be stored and accessed from anywhere. These technologies also support faster rendering and more efficient storage through cloud servers, reducing the burden on local hardware. Blockchain and NFT (Non-Fungible Token) technologies have introduced new ways for artists to sell and distribute their digital artworks, enabling digital ownership and authentication that is increasingly important in the modern art world (Paul, 2023).

Aside from specialised equipment and technologies, education and training in the use of these technologies also play an important role in the development of digital art. Many educational institutions and online courses provide specialised training in digital art, covering a range of software and creative techniques (Purnomo et al., 2022). Online learning sites such as Coursera, Udemy, and Skillshare offer courses guided by professionals in the industry, making knowledge and skills more accessible to anyone interested in digital art. Online communities such as DeviantArt and ArtStation also provide platforms for artists to share their work, get feedback, and learn from each other (Pan et al., 2021).

Thus, computer technology has brought about a major revolution in the digital art world, enabling artists to create works that were previously unimaginable. Advanced software such as Adobe Creative Suite, Blender, and Procreate provide diverse tools for different types of digital art. Powerful hardware such as workstations, high-spec

laptops, graphic tablets, and high-quality monitors support the creative process with optimal performance. Innovations in VR, AR, and network and cloud technologies advance the boundaries of artistic and collaborative possibilities. With education and a growing community, digital artists today have more resources and opportunities to explore their creativity. Computer technology continues to open up new avenues for artistic expression, making digital art a dynamic and ever-evolving field.

Conclusion

Computers have brought about significant changes in the creative industry and digital art by providing advanced software and creative tools that facilitate various types of artistic creations. Programmes such as Adobe Creative Suite, Blender, and Procreate provide various tools that support digital artists in creating detailed and high-quality works. Hardware such as powerful workstations, high-spec laptops, graphic tablets, and high-quality monitors also play an important role in helping artists work more efficiently and with better results.

In addition, computer technologies such as virtual reality (VR) and augmented reality (AR) have changed the way artists interact with their work. VR devices like Oculus Rift and software like Tilt Brush allow artists to paint in an immersive three-dimensional space, opening up new dimensions in the way art is created and experienced. Augmented reality also adds a layer of interaction, merging digital artworks with the real world, allowing for a more integrative and interactive experience for art lovers.

Networking and cloud technologies have become drivers of collaboration and efficiency in digital art. Cloud services enable the storage and access of project files from anywhere, as well as speeding up the rendering process that typically requires a large amount of computing power. Innovations such as blockchain and NFTs provide new ways for artists to sell and distribute their work, offering greater security and authentication. With educational support and training increasingly accessible through online courses, artists have more resources to learn and grow in the digital art world, making the field more dynamic and rapidly evolving.

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