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Exploring the intersection of AI and creativity in the local Indonesian graphic designers' perspective

ABSTRACT

This study examines the impact of Artificial Intelligence (AI) on creativity, focusing on the experiences of local graphic designers in Indonesia. As a rapidly evolving technology, AI has transformed various industries, including the realms of culture and entertainment. This research investigates how AI shapes the creative processes of Indonesian designers, explores the ethical concerns it raises, and evaluates its role in preserving and promoting cultural heritage. The study employs a qualitative approach, drawing insights from semi-structured interviews conducted with members of three professional graphic designer communities across Java, Indonesia. These communities, which have embraced AI tools in their work and emphasize integrating traditional Indonesian cultural elements into their designs, provided valuable perspectives on the influence of AI in their field. The findings reveal that AI technologies, particularly Generative Adversarial Networks (GANs), significantly enhance creativity by generating diverse design options and automating routine tasks, thereby freeing up time for deeper conceptual exploration and innovation. Moreover, AI's ability to digitize and archive traditional cultural motifs supports the preservation of Indonesia's artistic heritage, ensuring its accessibility for future generations. Furthermore, AI facilitates the promotion of traditional designs in modern contexts through digital platforms, thereby increasing their appreciation on both national and international levels.

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Introduction

Artificial Intelligence (AI) stands as one of the most monumental achievements in the technological advancements of the 21st century (Colosimo et al., 2021).

Its ability to process, analyze, and interpret data with unprecedented speed, precision, and scale has transformed various sectors of human life. In the annals of science and technology, this era will be marked as a pivotal period that radically transformed how we interact with technology, information, and ourselves. One profound aspect of the broad debate surrounding AI is its impact on popular culture and entertainment (Lyu et al., 2024).

Fundamentally, AI opens the door to creating, producing, and distributing entertainment content that is more personalized and relevant (Padovano & Cardamone, 2024). AI enables us to design entertainment experiences tailored to individual preferences, predict what we will enjoy, and automatically present customized content (Furnham et al., 2011).

A striking example is the application of AI technology in the film and television industry. Machine learning algorithms, capable of analyzing viewer preferences based on viewing patterns and history, have aided in creating more accurate content recommendations (Singh, Singh & Sharma, 2024).

AI can analyze elements within films that make them appealing to audiences, including plot, characters, and settings, thereby assisting filmmakers in designing more successful productions.

However, in the context of popular culture and entertainment, the impact of AI extends beyond enhancing viewer experiences. As a field that studies how humans think and feel, AI also has the potential to transform artistic creativity and cultural expression. Artists and content creators now have access to AI tools that can generate artworks, music, and narratives with previously unimaginable levels of complexity (Lieber-Milo et al., 2024; Reddy, 2022; Zembylas, 2023). AI characterizes a revolution in artistic creation that will spawn new forms of expression and pose philosophical challenges about creativity and artists' autonomy.

As we enter an era where AI becomes both a partner and a competitor in the creative process, questions about the boundaries between human-created and AI-created art become increasingly important (Ozmen Garibay et al., 2023). "*Can art produced by AI algorithms be considered genuine artistic expression?*" or "*Do they possess aesthetic and emotional value comparable to human creations?*" These questions stimulate deep debates about the essence of creativity and the identity of art. In a broader perspective, the application of AI in popular culture and entertainment also raises complex ethical issues. Questions about bias and control arise when machine learning algorithms influence what we watch, listen to, or read. "*How do we ensure this technology reinforces existing social biases and contributes to cultural diversity and inclusion?*" This question becomes increasingly urgent in an era where AI plays a growing role in shaping our worldview.

In this context, this research aims to meticulously and comprehensively investigate the impact of AI on popular culture and entertainment. Through deep analysis, we can understand how AI has affected the production and consumption of entertainment content, the role of AI in creating art, and the ethical implications related to AI usage in popular culture and entertainment. Thus, this research aims to understand current changes and provide insights into a future where AI will become an increasingly important partner in the world of entertainment and popular culture.

As an initial effort to answer these complex questions, this research will delve into the latest literature, conduct case studies, and analyze current trends in the application of AI in popular culture and entertainment (Bode, 2021; Lazaridis et al., 2022). Through a meticulous analytical framework and appropriate methodology, this research hopes to provide deeper insights into how AI shapes and influences our culture and how we can wisely respond to these developments in an increasingly advanced AI era. Then, this research strives to present a more profound view of the future of popular culture and entertainment in the AI era. Using AI as a creative tool is a challenge that requires a deep understanding of this technology as well as a deep understanding of art and culture. This research, focusing on the intersection of AI and designer perspectives in culture, contributes to our understanding of AI's role in shaping the increasingly complex and dynamic world of entertainment and popular culture.

Although often identified with significant changes in global entertainment, such as film and music, AI also plays a crucial role in stimulating changes in the design world, including local designers (Lieber-Milo et al., 2024; Loebbecke et al., 2024). Local designers are artists and creators who focus on developing art and design that is deeply rooted in and reflective of their cultural heritage and local traditions. They often incorporate motifs, symbols, and styles unique to their community's cultural identity into their work. AI has allowed local designers to explore their cultural roots more profoundly and align their artistic creations with their cultural heritage (Comes et al., 2019; Hta & Lee, 2020). It is important to note that local art carries unique cultural contexts and profound meanings linked to the identity and traditions of the local community. AI can play a role in enriching and rejuvenating these expressions of local art. AI can explore traditional motifs, styles, and symbols in design, helping local artists merge traditional elements with contemporary techniques (Stephenson, 2013; Wiratmoko & Sampurno, 2021).

Applying AI in local art also opens new opportunities for creating unique and innovative works. AI-based generative tools, such as Generative Adversarial Networks (GAN), can assist in creating unique artworks by combining elements from local cultural heritage. The use of GANs in local art has made it possible to create works that blend elements from multiple traditions and eras, creating more complex narratives in the form of art (Macedo, Ribeiro Vaz & Taveira Gomes, 2024).

Additionally, AI can aid in documenting, preserving, and disseminating local art and culture. With its ability to analyze, organize, and visualize data quickly, AI can be used in digital archiving and promoting local art to a broader, even international, audience (Cho, 2022). However, ethical and cultural issues become highly significant when considering AI's application in local culture. It is crucial to consider whether the use of AI in local art respects the values, beliefs, and cultural identity of the local community. Part of this issue relates to data usage, copyright, and ownership of artworks generated by AI algorithms (Björner & Aronsson, 2022). In the context of local designers, who are often linked to the traditions of the locality, it is vital to understand how the use of AI can respect and promote the cultural diversity that exists.

It relates to the componential theory, which posits that creativity requires a confluence of intrinsic motivation, domain-relevant skills, and creativity-relevant processes (Krasnoyarova, Indyukova & Garms, 2017). AI can enhance domain-relevant skills by providing designers with advanced tools and techniques, potentially increasing their creative output (Krasnoyarova, Indyukova & Garms, 2017). However, intrinsic motivation and creativity-relevant processes remain distinctly human elements that AI can complement but not replace. Cultural sustainability theory emphasizes the importance of preserving cultural heritage in the face of modernization and technological advancements (Cannon, 2018). AI tools can be utilized to sustain and revitalize traditional designs, ensuring they remain relevant and appreciated in contemporary contexts. This involves using AI to digitize and archive traditional art forms, making them accessible to future generations.

AI also intersects with Human-Computer Interaction (HCI), such as distributed cognition theory suggests that cognitive processes are distributed across individuals, objects, and technologies (Jeon et al., 2019). In the cultural or local design context, AI can act as an external cognitive tool that supports and enhances the creative process. Understanding how designers interact with AI tools and how these tools influence their creative workflows is crucial for maximizing their potential benefits. The abovementioned theory can make the research more comprehensively understand how AI influences creativity among Indonesian graphic designers. It will explore how AI tools are used to enhance traditional design practices, the ethical implications of AI in the creative process, and how AI can support preserving and promoting Indonesia's rich cultural heritage.

Methods

The study employs a qualitative research design to capture the depth and complexity of the investigated phenomena and understand the impact of AI on local Indonesian graphic designers. The participants in this study were selected using purposive sampling. This non-probability sampling method was chosen to ensure the participants were knowledgeable and experienced in using AI tools in graphic design. The criteria for inclusion were:

- Professional graphic designers who have used AI tools in their design process.
- Graphic designers with at least three years of experience in the industry.
- Designers actively work in Indonesia and participate in projects incorporating traditional Indonesian cultural elements.

A total of 3 graphic designers from different regions of Indonesia were selected to participate in the study. This sample size was sufficient to achieve data saturation in the qualitative component. The primary data collection method was semi-structured interviews with the selected graphic designers. Depending on the participants' locations and preferences, these interviews were conducted in person or via video conferencing.

The interview guide included questions on:

- Participants' experiences with AI tools in their design work.
- Specific projects where AI played a significant role.
- Perceived changes in their creative process due to AI.
- Ethical concerns and challenges encountered when using AI.
- The impact of AI on preserving and promoting Indonesian cultural heritage in their designs.

The interview transcripts were analyzed using thematic analysis, which involves identifying and interpreting patterns of meaning within qualitative data. The analysis followed Braun and Clarke's in Miles and Huberman six-step process to ensure a rigorous and systematic approach (Miles, Huberman & Saldana, 2018).

The first step, familiarization with the data, involved reading and re-reading the transcripts to become deeply acquainted with the content. This immersion allowed the researchers to gain an initial understanding of the data's breadth and depth. Next, the process of generating initial codes began. This step involved systematically coding exciting features of the data across the entire data set. Codes were assigned to text segments deemed relevant to the research questions, capturing key concepts and themes that emerged from the participants' responses.

The third step, searching for themes, entailed collating the codes into potential themes and gathering all data relevant to each potential theme. It involved looking for patterns in the codes and organizing them into broader themes that encapsulated significant aspects of the data.

Once potential themes were identified, the fourth step, reviewing themes, was undertaken. This step involved checking if the themes worked about the coded extracts and the entire data set. Themes were refined, combined, or discarded based on their coherence and relevance to the research questions. In the fifth step, defining and naming themes, the specifics of each theme were refined, and clear definitions and names for each theme were generated.

This process ensured that each theme was distinct and encapsulated a specific aspect of the data. Finally, the sixth step, producing the report, involved selecting vivid, compelling extract examples and relating the analysis to the research questions and literature.

Discussion

Ethical Implications of AI in Indonesian Graphic Design

Interviewee 1: Community A, a graphic designer community from Jakarta with 5 years of experience in using AI tools

Q: How do you feel about the use of AI in graphic design, especially regarding data usage and ownership?
A: "I find AI tools very helpful in speeding up my design process, but there are significant concerns about data usage. Many of these AI tools use large datasets, some of which include traditional designs and motifs that are part of our cultural heritage. It's important to ensure that these datasets are used ethically and that the communities from which these designs originate are acknowledged and compensated appropriately."

Q: Have you encountered any issues related to copyright when using AI tools?
A: "Yes, copyright issues are quite challenging. AI-generated designs often incorporate elements from traditional art, which makes it hard to determine ownership. There needs to be clear guidelines on how to attribute these works correctly, ensuring that both the AI developers and the communities whose cultural symbols are used are recognized and protected."

Q: What are your thoughts on respecting cultural identity in AI-generated designs?
A: "Respecting cultural identity is crucial. Our culture is diverse and rich with traditions that need to be honored. AI tools should be designed to understand and respect these cultural contexts. When using traditional motifs, it's vital to ensure that the designs are not offensive or misaligned with their cultural meanings."

Q: What ethical guidelines do you think should be developed for using AI in graphic design?
A: "Ethical guidelines should include principles for ethical data collection and usage, ensuring proper consent and attribution. There should be clear rules about copyright and ownership, and a framework for compensating communities. Continuous dialogue with local communities is essential to ensure that AI applications respect and promote cultural diversity and heritage."

Interviewee 2: Community B, a graphic designer community from Yogyakarta with 4 years of experience in using AI tools

Q: How do you perceive the use of AI in terms of data usage and ownership?
A: "AI tools are powerful, but there's a real risk of exploitation if data is used without proper regulation. Traditional designs and symbols should not be commercialized without giving credit to their cultural origins. It's essential to have clear policies on who owns the data and how it's used."

Q: Can you share your experience with copyright issues related to AI-generated designs?
A: "Determining the ownership of AI-generated designs is complicated. These tools can create designs that incorporate traditional cultural elements, and it's not always clear who holds the rights to these designs. There should be guidelines to protect the intellectual property of local artists and communities."

Q: How important is it to respect cultural identity in AI-generated designs?
A: "Very important. Indonesian culture is unique, and AI tools should be sensitive to this. When AI generates new designs based on traditional motifs, it's essential to ensure that these designs are respectful and accurate representations of the culture they originate from."

Q: What kind of ethical guidelines do you think are necessary for AI use in graphic design?
A: "We need comprehensive ethical guidelines that cover data collection, copyright, and ownership issues. These guidelines should ensure that cultural data is sourced ethically and with consent, and that AI-generated designs are attributed correctly. There should also be ongoing engagement with local communities to ensure their cultural heritage is respected."

Interviewee 3: Community C, a graphic designer community from Bandung with 4 years of experience in using AI tools

Q: How do you feel about the use of AI in graphic design, especially regarding data usage and ownership?
A: "AI tools are amazing, but the way data is used is a big concern. A lot of these datasets include culturally important designs, and it's crucial to handle that data responsibly. Communities should get credit and fair compensation for their contributions."

Q: Have you encountered any issues related to copyright when using AI tools?
A: "Yes, copyright is definitely an issue. AI blurs the lines of ownership, especially when it uses traditional cultural elements. We need clear rules to protect both developers and cultural communities."

Q: What are your thoughts on respecting cultural identity in AI-generated designs?
A: "Respecting cultural identity is non-negotiable. Our cultural heritage is incredibly rich, and AI tools should honor that. Traditional designs shouldn't be misrepresented or used disrespectfully."

Q: What ethical guidelines do you think should be developed for using AI in graphic design?
A: "There should be guidelines for ethical data sourcing, consent, and fair attribution. It's also important to engage with communities to make sure their cultural heritage is respected and celebrated."

The integration of AI into Indonesian local graphic design raises several ethical considerations, particularly regarding data usage, copyright, and ownership of AI-generated designs. The insights gathered from interviews with Indonesian graphic designers, such as Community A, Community B, and Community C, highlight the importance of managing cultural data responsibly to prevent exploitation (Morgner, 2014). Community A emphasized the necessity of ensuring that datasets, which often include traditional designs and motifs, are used ethically, with proper attribution and compensation to the originating communities (Table 1). This aligns with the componential theory of creativity, which underscores the importance of intrinsic motivation and domain-relevant skills (Badilescu & Packirisamy, 2022; Behnamnia et al., 2020). Ethical data usage and ownership policies are crucial to maintaining the integrity and value of these cultural elements.

Copyright issues complicate traditional notions of authorship in AI-generated designs (Björner & Aronsson, 2022). Designers like Community B and Community C pointed out the difficulties in determining ownership when AI tools create designs incorporating culturally significant symbols. Establishing clear copyright guidelines is essential to protect the intellectual property rights of both AI developers and the communities whose cultural elements are used. This cognitive processes are distributed across individuals, objects, and technologies (Xie, 2023).

But, respect for cultural identity is another significant ethical issue (Mayuzumi, 2021; Zhang & Stewart, 2017). Community A stressed the importance of ensuring AI-generated designs are not offensive and align with the cultural meanings of the original symbols. Community B and Community C echoed this sentiment, emphasizing that AI tools must honor and respect Indonesia's diverse cultural traditions (Table 1).

This perspective is emphasizing the preservation of cultural heritage in the face of modernization that AI tools must be designed to accurately reflect and respect the cultural context and values of the symbols they incorporate, thereby preserving the authenticity of cultural expressions (Bock & Borland, 2011; Iacono & Brown, 2016). Meanwhile, the importance of developing ethical AI applications that respect cultural diversity and heritage is needed to address the various dimensions of AI integration in graphic design.

The Role of AI in Enhancing Creativity and Preserving Indonesian Cultural Heritage

AI tools, such as Generative Adversarial Networks (GANs), have opened new avenues for creativity among Indonesian graphic designers, allowing them to create unique designs that blend traditional and contemporary elements. These tools support the documentation, preservation, and promotion of Indonesia's rich cultural heritage, making traditional designs accessible in the modern digital era.

Integrating AI into Indonesian graphic design has significantly enhanced creativity and contributed to preserving and promoting cultural heritage (Table 2).

Table 1

Ethical Considerations and Cultural Sensitivity in AI Tool Usage Among Graphic Designers

Interviewee	Key Points	Data Usage and Ownership	Copyright Issues	Respect for Cultural Identity	Ethical Guidelines Development
Community A	Graphic designer from Jakarta with 5 years of experience in using AI tools	Concerns about ethical use of cultural data and need for proper attribution and compensation	Challenges in determining ownership of AI-generated designs and the need for clear guidelines	Importance of ensuring AI-generated designs respect cultural meanings and are not offensive	Ethical guidelines should include principles for ethical data collection, copyright, and ownership, and continuous dialogue with local communities
Community B	Graphic designer from Yogyakarta with 4 years of experience in using AI tools	Risk of exploitation if data is used without regulation and importance of clear ownership policies	Complications in determining rights for AI-generated designs involving traditional elements	AI tools should be sensitive to cultural uniqueness and ensure accurate representations	Comprehensive guidelines covering data collection, copyright, ownership, and engagement with local communities are necessary
Community C	Graphic designer from Bandung with 4 years of experience in using AI tools	Importance of managing culturally significant data responsibly with proper attribution and compensation	Blurred lines of ownership with AI-generated designs and the need for clear protection of rights	AI tools must honor cultural heritage and avoid mis-representation	Ethical guidelines should ensure ethical data sourcing, fair attribution, and continuous dialogue with local communities

Interview data from Indonesian graphic designers Community A, Community B, and Community C highlights how AI tools, particularly Generative Adversarial Networks (GANs), open new avenues for creative exploration. Community A emphasizes that AI tools generate diverse design variations, which inspire new creative possibilities and enhance the efficiency of the design process. Creativity involves a confluence of domain-relevant skills and creativity-relevant processes using automating repetitive tasks to allow AI designers like Community B to focus more on ideation and experimentation, expanding their creative horizons.

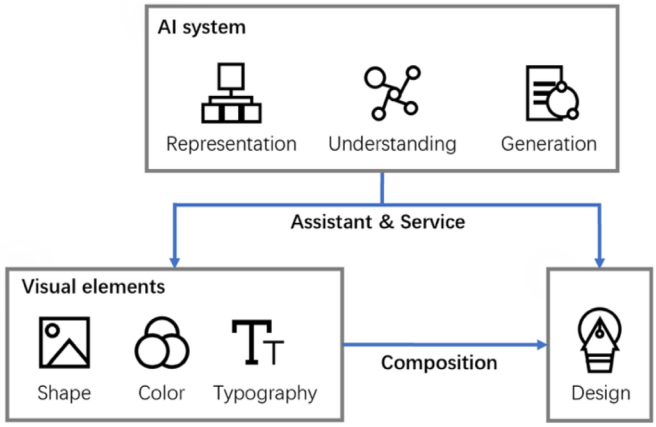
AI also plays a crucial role in documenting and preserving traditional Indonesian designs. As Community C notes, AI tools facilitate digitizing and archiving cultural data for traditional art forms preserved to time.

It underscores the importance of preserving cultural heritage in the face of modernization by analyzing and organizing vast amounts of cultural data. AI ensures that these cultural expressions are preserved and can be accessed by future generations to maintain the integrity and continuity of Indonesia's rich cultural heritage. The integration of artificial intelligence (AI) into graphic design is transforming both element-level and design-level tasks, as shown in Figure 1. At the element level, AI aids in representing, understanding, and generating visual elements. For instance, AI can recognize and categorize images based on their content, making it easier for designers to find relevant visuals quickly (Sison et al., 2023; Vakratsas & Wang, 2021). AI algorithms can also analyze these elements' emotional and aesthetic qualities, suggesting adjustments to align with the desired outcomes, such as color adjustments and contrast optimization.

Table 2

The Role of AI Tools in Enhancing Creativity and Preserving Cultural Heritage Among Graphic Designers

Interviewee	Key Points	Enhancing Creativity	Preserving Cultural Heritage	Promoting Cultural Heritage	Impact on Intrinsic Motivation and Creative Processes
Community A	Graphic designer from Jakarta with 5 years of experience in using AI tools	AI tools like GANs generate diverse design variations, inspiring new creative possibilities and enhancing design efficiency.	Digitization and archiving of traditional designs help preserve cultural expressions.	AI helps showcase traditional designs in modern contexts, making them relevant and appreciated by a broader audience.	AI complements creative processes, allowing designers to focus on ideation and maintaining the authenticity of cultural expressions.
Community B	Graphic designer from Yogyakarta with 4 years of experience in using AI tools	AI automates repetitive tasks, freeing time for experimentation and ideation, expanding creative horizons.	AI tools facilitate the documentation and organization of vast cultural data, ensuring easy retrieval and preservation of traditional designs.	AI aids in creating digital platforms for showcasing traditional and AI-enhanced designs, promoting them nationally and internationally.	AI supports creative output without replacing human insights, balancing technical capabilities with cultural authenticity.
Community C	Graphic designer from Bandung with 4 years of experience in using AI tools	AI offers new techniques that inspire innovative design solutions, enhancing the creative process.	AI ensures that traditional art forms are not lost by analyzing and organizing cultural data for future generations.	AI revitalizes traditional designs, presenting them in contemporary settings and increasing their value and appreciation.	AI enhances technical capabilities while preserving the designer's unique creative insights and cultural authenticity.



» **Figure 1:** *Graphic Design Intelligence before AI*

Moreover, AI's capability to generate new visual elements based on learned patterns and styles significantly expands the creative toolkit available to designers.

In Indonesia, local graphic designers are increasingly adopting these AI tools to enhance their creative workflows and maintain competitiveness in a rapidly evolving market (Marsudi et al., 2020). The Indonesian graphic design industry is known for its rich cultural heritage and vibrant visual language, often reflected in local designs. By integrating AI, Indonesian designers can efficiently incorporate traditional elements with modern aesthetics, creating unique and culturally resonant designs. Practical applications of AI in graphic design are evident in tools such as Adobe Sensei, Midjourney, ChatGPT, and Canva's design suggestions. Adobe Sensei integrates AI into Adobe's suite of design tools to streamline repetitive tasks, provide design suggestions, and enhance creative workflows. Similarly, Canva utilizes AI to offer design templates and element suggestions, democratizing professional design by making it accessible to non-designers. Adopting these AI tools in Indonesia is helping local designers streamline their processes and explore new creative possibilities. AI-driven tools enable Indonesian designers to create more personalized and engaging designs that cater to diverse audiences, such as analyzing local market trends and consumer preferences, allowing designers to create tailored visual content that resonates with specific target groups. This capability is precious in Indonesia's diverse cultural landscape, where design preferences vary significantly across different regions.

Moreover, AI significantly contributes to the promotion of cultural heritage. Community B highlights how AI aids in creating digital platforms where traditional and AI-enhanced designs are showcased, facilitating their dissemination and appreciation nationally and internationally. Through AI, traditional designs can be revitalized and presented in contemporary contexts, making them relevant to modern audiences. This promotional aspect suggests that cognitive processes are distributed across individuals, objects, and technologies. The impact of AI on the intrinsic motivation and creative processes of designers also enhances technical capabilities; the intrinsic motivation and creative insights of designers remain distinctly human elements. Community A and Community C both emphasize that AI is a complementary tool that augments creative output without replacing the unique creative insights of designers.

Conclusion

The integration of AI into the field of graphic design in Indonesia has introduced both opportunities and challenges, particularly concerning ethical considerations, cultural sensitivity, and the enhancement of creative processes.

The interviews with Indonesian graphic designers from Jakarta, Yogyakarta, and Bandung highlight critical concerns about the ethical use of cultural data, copyright issues, and the necessity of respecting cultural identity.

Key findings emphasize the importance of managing cultural data responsibly to prevent exploitation and ensure proper attribution and compensation to the originating communities. Clear guidelines on ownership and copyright of AI-generated designs are crucial to protect intellectual property rights and maintain the integrity of traditional cultural elements. Ethical guidelines must be developed in collaboration with local communities to address these issues comprehensively. AI tools such as Generative Adversarial Networks (GANs) have significantly enhanced creativity among Indonesian graphic designers, allowing for innovative designs that blend traditional and contemporary elements.

These tools support the documentation, preservation, and promotion of Indonesia's rich cultural heritage, ensuring that traditional designs are accessible and appreciated in the modern digital era.

The practical applications of AI in graphic design are evident in tools like Adobe Sensei, Midjourney, ChatGPT, and Canva. These tools streamline repetitive tasks, provide design suggestions, and enhance creative workflows, enabling designers to focus on ideation and maintaining the authenticity of cultural expressions. The adoption of AI tools in Indonesia is helping local designers create personalized and engaging designs that cater to diverse audiences, reflecting the country's rich cultural landscape. AI's role in promoting cultural heritage is also significant, facilitating the dissemination and appreciation of traditional and AI-enhanced designs both nationally and internationally. By revitalizing traditional designs and presenting them in contemporary contexts, AI ensures that these cultural expressions remain relevant and appreciated by modern audiences. While AI offers substantial benefits in enhancing creativity and preserving cultural heritage, it is imperative to establish ethical guidelines that address data usage, copyright, and cultural sensitivity.

Continuous dialogue with local communities is essential to ensure that AI tools are used ethically and respect the diverse cultural traditions of Indonesia. The integration of AI in graphic design should be approached with a balanced perspective that values technological advancements and cultural authenticity preservation.

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