



Impact of Artificial Intelligence Automated Asset Generation (AI-AAG) on the Graphic Designer's Profession

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ABSTRACT. The rapid advancement of Artificial Intelligence (AI) and machine learning has transformed creative industries worldwide, raising important questions about the future of human creativity and professional practice. In the field of graphic design, the emergence of Automated Asset Generation (AI-AAG) tools has introduced new ways of creating and conceptualizing visual content. However, this technological shift also brings uncertainty, challenging traditional design workflows, redefining creative authorship, and reshaping the skills required of designers.

This study investigates the impact of AI-AAG on the graphic design profession, focusing on how these technologies influence designers' daily practices, opportunities, and ethical considerations. Drawing on responses from 140 Adobe Sensei users, the research examines both the benefits and challenges of AI integration in design. Beyond evaluating the technology itself, the study provides practical recommendations for designers and organizations on effectively integrating AI into creative processes, fostering collaboration between human and machine creativity, and addressing emerging ethical concerns in AI-driven design practice.

Keywords: Creativity, Automated Asset Generation tools, Artificial Intelligence, Ethics, Graphic design.

INTRODUCTION

The field of graphic design (GD) has experienced notable progressions following the integration of artificial intelligence (AI) technologies. One prominent area of interest within this domain is the use and transformation of ready-made graphic design, which refers to the use of pre-existing design assets or templates to create innovative designs. This research aims to investigate the impact of ready-made graphic design in the context of AI on the profession of graphic designer.

In the realm of GD, AI is reshaping the landscape. This groundbreaking technology offers fresh perspectives and revolutionizes designers' approaches to their craft. It prompts us to ask questions about:

1 - What influence does Automation of repetitive tasks have on designer creativity?

One of the most significant contributions of AI to GD profession is the automation of repetitive tasks that we called in this paper Automated Asset Generation (AAG). Intelligent algorithms and specialized software now enable the automation of tedious tasks like creating layouts, selecting harmonious colors, and generating typography. This may allow designers to allocate more time to higher value-added tasks.

2- Does AI Increase the creativity of designers?

AI acts as a catalyst for the creativity of graphic designers. AI-powered tools offer features for automatic content generation, design suggestion, and innovative concept exploration. For instance, designers use Adobe Sensei tools to seek inspiration, experiment with innovative ideas, and expand the boundaries of their creativity. AI can serve as a creative partner by offering intelligent suggestions and unlocking new creative perspectives.

3- How does the integration of AI-Automated Asset Generation (AI-AAG) in graphic design challenge the role of human creativity, and to what extent could it potentially replace or augment the creative process?

In this research, we also address the issue of the potential replacement of human creativity by AI-AAG. With the emergence of AI technologies, there is a growing concern that machines may replace human creativity, resulting in job loss and the devaluation of creative professions. However, there is an increasing recognition that AI has the potential to serve as a powerful tool to aid and collaborate with human creatives, enhancing their abilities and broadening the scope of creative expression.

In this paper we will discuss the intersection of art and design in the context of technological advancement. It highlights how the evolution of technology has led to a transformation in creative expression and design practices. The integration of AI and other technological innovations has played a significant role in merging artistic creativity with technological creativity, thereby influencing aesthetic trends and creative thinking.

The development of intelligent technologies has eased the convergence of traditional design processes with modern digital mediums, enriching the aesthetic experience and opening new avenues for creative exploration. This fusion of art and technology has led to the emergence of contemporary art forms that use advanced tools and techniques to push the boundaries of creativity (Shen & Yu. 2021), such as Adobe Sensei AAG created to enhance the creativity of designers.

As (Meron Y, 2022) states: "Starting with the electronic publishing revolution of the late twentieth century, a process that once empowered graphic designers, recent technological advances have enabled the democratization of design, allowing non-professional practitioners increasing access to many aspects of graphic design." Our research emphasizes the impact of technological advancements on the philosophy of contemporary design, emphasizing the importance of innovation and experimentation in designers' expression. While technology serves as a tool for designers to enhance their creative processes, the designer's innate sense of originality and innovation remains paramount.

Overall, this paper underscores the transformative role of AI in shaping the field of GD, offering new possibilities for designers' expression and innovation.

PROBLEM STATEMENT

The growing integration of Artificial Intelligence (AI) and machine learning technologies into the field of graphic design, particularly through Automated Asset Generation (AI-AAG) tools—has begun to transform traditional creative workflows. While these technologies offer efficiency and innovation, they also raise significant concerns about their impact on designers' roles, creativity, and ethical responsibilities. Despite the increasing adoption of AI-AAG systems, there is limited empirical research examining how these tools influence the daily practices, decision-making processes, and professional identity of graphic designers. This gap highlights the need to understand both the advantages and challenges of AI integration in design practice, as well as to develop strategies that promote productive collaboration between human creativity and intelligent systems.

THEORETICAL FRAMEWORK ARTIFICIAL INTELLIGENCE (AI)

Before its formal naming in 1956 by mathematicians John McCarthy and Marvin Lee Minsky, the concept of artificial intelligence appeared in the 1940s within the realm of applied mathematics. The underlying notion was that "all intelligent activity can be modeled and reproduced by an artificial device" (Rougetet, L., 2016). Today, these functions can be acquired, enabling programs to replicate and even surpass human cognitive abilities in terms of speed and complexity. This involves coding the computer program using algorithms, translating elements of natural language into a mathematical language consisting of symbols and binary code (composed of 1s and 0s) that machines can understand.

Bonnet A, (1986) states that artificial intelligence is a modern cognitive science that aims to simulate intelligent human behavior and ease problem-solving and decision-making in various situations. We can deduce that Artificial Intelligence is a branch of computer science dedicated to recreating a technological equivalent to human intelligence. It includes a collection of technologies and tools rather than being standalone technology. (Davenport T., and Kalakota R., 2019). AI technologies include machine learning, deep learning, natural language processing, expert systems, and speech and vision processing. (Chopra, R. 2012)

The features of artificial intelligence, as outlined by Bonnet (1986), center around symbolic representation, which involves using non-numeric symbols to convey information and employing symbols for reasoning. This reasoning process involves finding solutions through specific logical steps, akin to experimental research methodologies. Additionally, AI programs possess the capability to manage conflicting data, allowing them to navigate situations where data may contradict each other. Furthermore, artificial intelligence shows the ability to learn, mirroring human learning behaviors such as observational learning and learning from past mistakes. To achieve this, AI programs rely on strategies for machine learning and knowledge representation, which involve building a vast knowledge base that connects cases, outcomes, and incomplete data. This enables AI systems to provide solutions even when faced with incomplete information.

AUTOMATED ASSET GENERATION (AAG)

The term "automation" originates from the Greek word "automatos," meaning "seemingly moving by itself, driven by a concealed mechanism." It contrasts with the more recent term "robot," which has Slavic origins, stemming from the Czech word "robota," signifying "hard work" or "chore." Automation, also known as cybernetics, involves the study of command, communication, control, and regulation processes within various systems, whether machines,

living organisms, or communities. The term "cybernetics" originates from the ancient Greek word "Kubernētēs," which means helmsman, referring to the person responsible for steering a boat. (Taylor Coe, 2015)

AAG refers to AI content generator. It is a tool that automatically creates designs from user-entered data. "It helps users quickly create different types of content, such as logos, posters, image manipulation and packaging etc. more opportunity and time to concentrate on the creative side of projects" (Nolan C, 2018).

Researchers in robotics, AI, and cognitive sciences are fascinated by the Turing question and are exploring the complexities of the nervous system, especially intelligence. "Their goal is to design machines capable of language use, concept manipulation, problem-solving, and autonomous learning. The underlying hypothesis is that any aspect of learning or intelligence can theoretically be described to a machine, enabling it to simulate human-like behaviors and cognitive processes". (Russell S. et Norvig P.2017)

ADOBE SENSEI

Adobe Sensei is an AI and machine learning framework created by Adobe Systems, designed to enhance, and support various applications and services within Adobe Creative Cloud. (Wernersson J, Persson R, 2023).

Many professional graphic designers rely on Adobe Creative Cloud, which incorporates Adobe Sensei, a technology that adds intelligence to Adobe products, it aims to help them work more efficiently, create content quicker, and deliver it to the right audience, through the right channels, at the right time. Adobe is constantly enhancing its AI, machine learning, and deep learning capabilities within Adobe Sensei, focusing on three principal areas: understanding content, computational-based creativity, and enhancing user experience with intelligence.

Adobe Sensei is designed to emulate the human ability to deeply understand the language of digital content, such as images, videos, animations, and illustrations. The designer can thus more quickly improve digital experiences and increase personalization. (Nafidah & Suratman, 2020) For instance, navigating through Adobe Stock's vast library of over one hundred million assets can be daunting and time-consuming when searching for the ideal image. However, with the integration of AI and deep learning, Adobe Sensei goes beyond merely recognizing objects within images. It understands complex concepts like aesthetics, composition, color scheme, and even the emotions conveyed in the image.

Adobe Sensei features examples:

- Automated Captions: using Sensei in Premiere Pro to automate captions in videos. This saves so much time in post-production, and it also ensures videos are more accessible to those watching them.
- Trace and Vectorize Sketches: using Sensei in Adobe Illustrator for iPad to trace and vectorize sketches. This is a right and fast way to turn rough drawings into smooth vector artwork. The Sensei feature works more effectively than using the image trace tool.
- Neural Features: the neural filters in Photoshop are a great Sensei tool. Skin-smoothing, JPEG artifacts removal, landscape mixer, and facial filters are just a handful of the offered filters, and they are guaranteed to save time.
- Content-Aware Tools: content-aware filters are a Sensei tool available in Photoshop, Lightroom, After Effects, and Premiere Pro. Content-aware works like a much more effective clone or healing brush, allowing to delete parts of an image or video without an obvious section of the background missing.
- Body and Emotion Tracker: In Adobe Animate, the AI tools from Sensei can give natural movement to vector characters for animations. This tool will increase natural movements or human features in a fast and reliable way.

GRAPHIC DESIGN BETWEEN AI AND HUMAN CREATIVITY

GD is the art of visually crafting content that communicates with an audience. As a form of visualization, creativity stands as one of the most powerful communication arts, and with rapid digitalization, it is driving a change in thinking in visual science communication. (Ynnerman, Löwgren, Tibell, 2018). Drevdahl describes Creativity as “the ability of persons to produce compositions, products, or ideas of any sort which are new or novel, and previously unknown to the producer. It can be imaginative activity, or thought synthesis, where the product is not a mere summation It may involve the forming of new patterns and combinations of information derived from past experience, and the transplanting of old relationships to new correlates. It must be purposeful, or goal directed, not mere idle fantasy- although it need not have immediate practical application or be a perfect and complete product It may take the form of an artistic, literary, or scientific production or may be of a procedural or methodological nature.” (Drevdahl, J E, 1956, p22). Thomas Aquinas, author of the “Summa Theologiae”, maintains that “to create is to make something out of nothing” (Thomas A, 2011, p. 472). Today, design encompasses both creation and creativity, particularly in the application of design thinking or co-design methods within innovation projects involving multiple stakeholders. (Winchester, 1985). These two perspectives often clash: proponents of creation fault those emphasizing creativity for disregarding the profession's specific knowledge and expertise. Indeed, there is often tension between these two approaches: some argue for the importance of traditional creation, while others emphasize the need for creative problem-solving in business projects.

Whether it is about creation or creativity, we will focus on how the field of design fits within the broader context of artificial sciences, as discussed by Simon (Simon, H. A. 1996). Design activity involves solving complex problems (Visser, W. 2009), often influenced by the client's expectations since the designed artifacts are meant for them, whether they are individuals, organizations, or society. In the field of design sciences, we distinguish between initial stages focused on concept development and later stages involving detailed design, testing, and refinement (Bouchard, C. 2011). The first stages, being less formalized and more strategic, are where design sciences are most applied. In GD production, the creative process is complex and iterative, blending both conscious and subconscious thought, along with collaboration and refinement, to create work that is original, meaningful, and impactful. (Saris, 2019).

Research Questions:

- 1- How has AI influenced the creation and use of ready-made graphic design assets?
- 2- What are the benefits and limitations of incorporating AI in the ready-made graphic design process?
- 3- How has AI affected the creative freedom and originality of designers when working with ready-made graphic design elements?
- 4- What are the implications of AI-powered ready-made graphic design for businesses, marketers, and individuals?
- 5- How do designers and AI systems collaborate in generating ready-made graphic designs, and what challenges and opportunities does this collaboration present?
- 6- What key factors need to be evaluated when incorporating AI-AAG into GD?

Methodology and Expected Impact:

To gather quantitative data on user preferences, insights, and satisfaction, we distributed a survey to various groups, including professional graphic designers, AI experts, and users of ready-made graphic design assets such as Adobe Sensei. This survey aimed to collect insights into the impact of AI on the graphic design profession, focusing on aspects such as the creative process, design quality, and user experience. We employed multiple channels to reach respondents, including LinkedIn, Facebook, and email outreach to colleagues in the design community. Ultimately, we received responses from 140 participants across different countries, including the USA, Canada, France, Tunisia, the UAE, and Egypt.

This survey is divided into three sets of questions:

- 1- The first set of questions concerns Designers' insights on AI tools, particularly Adobe Sensei AAG.
- 2- The second set of questions focuses on the Impact of AI-AAG on Graphic Design Jobs, covering aspects such as time savings, creative control, learning curve, job security, satisfaction, and future outlook.

3- The third set of questions explores the impact of AI-AAG on the ethics of the Graphic Design profession.

This research aims to contribute to the understanding of how AI is reshaping the GD landscape, specifically in the context of ready-made design. By exploring the benefits, limitations, and implications of AI-powered ready-made graphic design, this research can help designers, businesses, and users make informed decisions and effectively use AI technologies in their design processes. Additionally, the findings may provide insights into the future of design, the role of human creativity in an AI-driven environment, and potential ethical considerations surrounding the use of AI in GD.

LITERATURE REVIEW

To conduct a thorough literature review and set up a theoretical framework to understand the current landscape of AI in GD and ready-made design processes, the researcher found three pertinent papers related to our subject matter:

1- The first paper, titled "The Impact of Artificial Intelligence on the Graphic Design Industry," authored by Bahaa Mustafa (2023), explores the potential influence of AI technology on graphic design. The findings show a significant positive impact on the field, as reported by most graphic designers. Improved workflow, enhanced creativity, and superior outcomes were commonly cited benefits. Nonetheless, challenges such as technological limitations and the necessity for proficient technical skills were also highlighted in the study. However, the research focused more on the positive aspects of AI than the negative ones, particularly its impact on the ethics of the graphic design profession.

2- The second paper titled: "The Influence of Artificial Intelligence on Art Design in the Digital Age" authored by Yan Shen and Fang Yu (2021), this study proposes how AI technology can revolutionize the traditional approach to interactive art expression, affecting creative thinking, creation methods, and art experiences. It suggests setting up an intelligent interactive art creation model within the context of AI. By analyzing the influence of AI on interactive art expression forms, it finds changes in the original concept of art aesthetics, particularly in space, time, and natural logic. The paper focuses on deconstructing and reconstructing interactive art expression using AI and proposes a method for authenticating digital Chinese paintings with the aid of AI-based twin networks. The proposed method proves high sensitivity to digital forgeries and scalability through experimental analysis.

3- The third research paper: "Artificial Intelligence vs designer: The impact of Artificial Intelligence on design practice" authored by Andra Irbite and Aina Strode (2021), came with the following results:

Advancements in technology offer designers opportunities to streamline workflows, reduce time and expenses. The integration of AI into design services transforms business models, dropping the necessity for human designers and managers in product development, customer collaboration,

and sales. This shift needs designers to get new competencies focused on problem-solving loops and innovative design solutions. Consequently, designers must now adopt roles akin to curators, innovation managers, or art directors, blurring the lines between design and management disciplines. Additionally, while AI enhances efficiency in design processes, it cannot completely replace human designers as they could figure out the significance of design decisions and when to approve or reject solutions. However, it does not take into account that the evolving landscape of design education may lead to a decrease in demand for traditional design education, prompting the need for revisions in educational processes and content.

SURVEY ANALYSIS

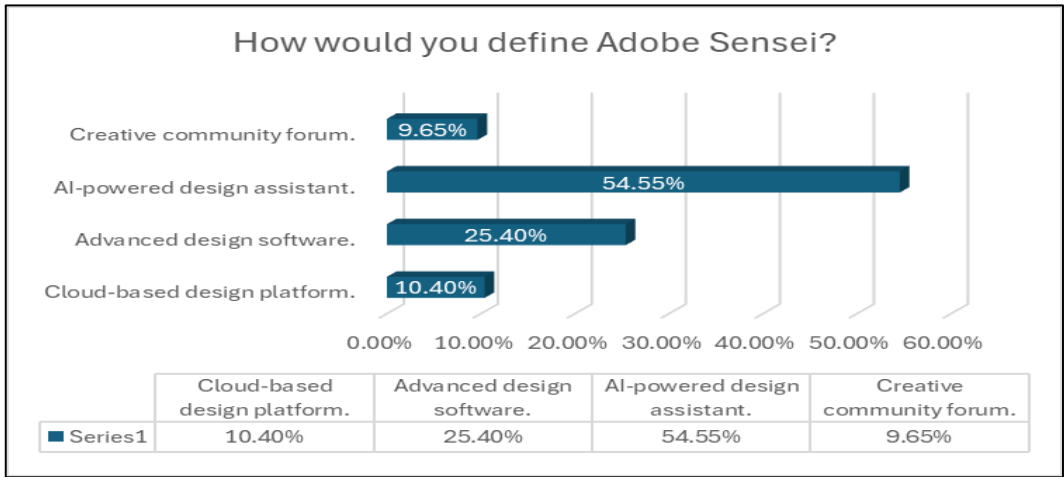


Figure 1: Definition of Adobe Sensei from Designers' Perspective.

This graph illustrates that over half of the designers (54.55%) were aware that Adobe Sensei is an AI-based design assistant. However, 45.45% of respondents were not familiar with Adobe Sensei; some mistakenly identified it as either a creative community forum or a cloud platform for design software.

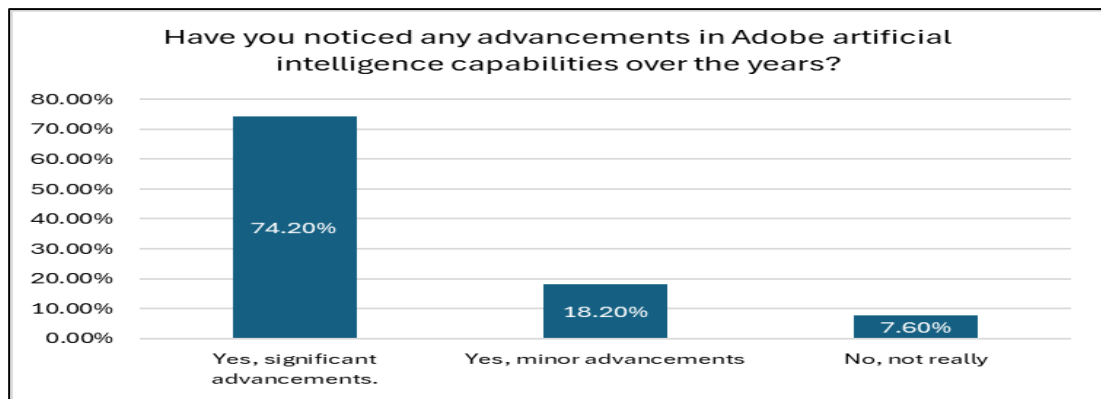


Figure 2: Advancements in Adobe AI Capabilities over the years.

Most designers have seen a significant advancement in Adobe's AI capabilities. However, when we correlate this finding with the earlier one (figure 1), we note that almost a third of respondents, despite recognizing the advancement in Adobe's AI tools, were unaware that the AI-powered design assistant is called Adobe Sensei.

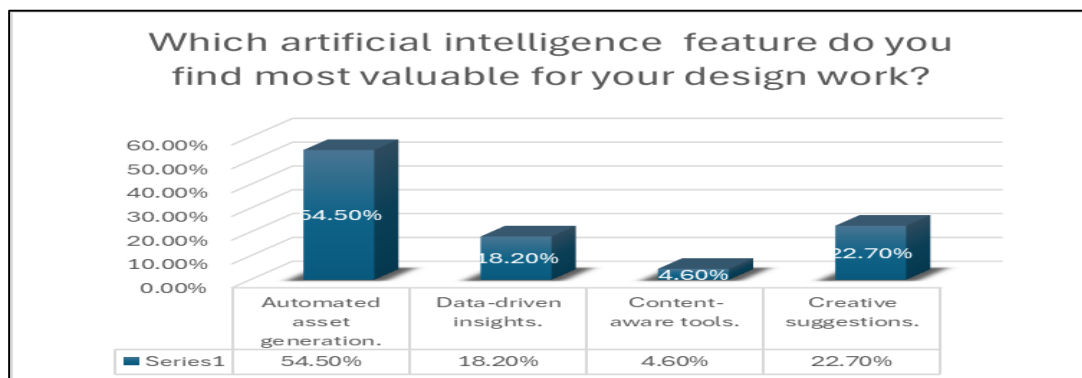


Figure 3: Most valuable AI feature.

AAG appeared as the most valuable feature from the perspective of respondents. While it was initially assumed that the creative suggestions feature would be most prized, automation holds greater appeal to designers, as it is seen as a tool that can help them save time. These findings reveal that AAG is the most valued AI feature among designers for their design work, with 54.5% of respondents expressing this preference. This shows that designers highly appreciate the ability of AI to automate the generation of assets such as graphics, illustrations, or templates, which can significantly streamline their workflow and save time. In contrast, a smaller percentage of respondents mentioned other AI features as most valuable. Data-driven insights were mentioned by 18.2% of designers, showing that some designers prioritize the use of AI algorithms to analyze data and inform their design decisions. Content-aware tools were mentioned by only 4.6% of respondents,

suggesting that fewer designers prioritize the manipulation and adaptation of content in their design process. Creative suggestions were mentioned by 22.7% of respondents, indicating that a notable portion of designers value AI's ability to provide creative inspiration and generate design ideas. This suggests that while automated asset generation is highly valued for its efficiency and productivity benefits, creative input from AI is also appreciated by a sizable part of designers for its role in enhancing creativity and ideation.

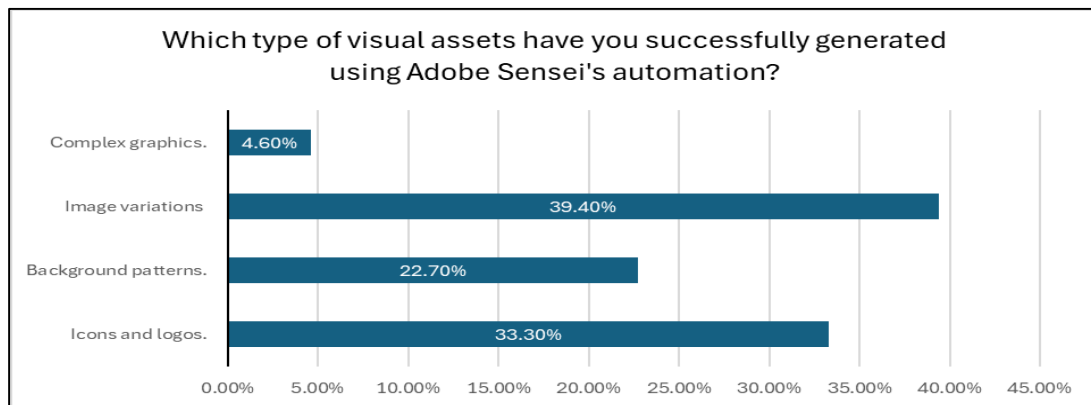


Figure 4: Types of visual assets generated by designers using Adobe Sensei

Based on the responses, it is clear that a massive portion of designers have successfully utilized Adobe Sensei's automation for generating various types of visual assets. The most generated assets include image variations, with 39.4% of designers indicating their use. Icons and logos are also popular, mentioned by 33.3% of respondents. Background patterns were mentioned by 22.7% of designers, showing their use in design projects. However, complex graphics were mentioned by only 4.6% of respondents, suggesting that they may be less often generated using Adobe Sensei's automation. Overall, these findings highlight the versatility of Adobe Sensei's automation in helping designers with generating a wide range of visual assets for their projects.

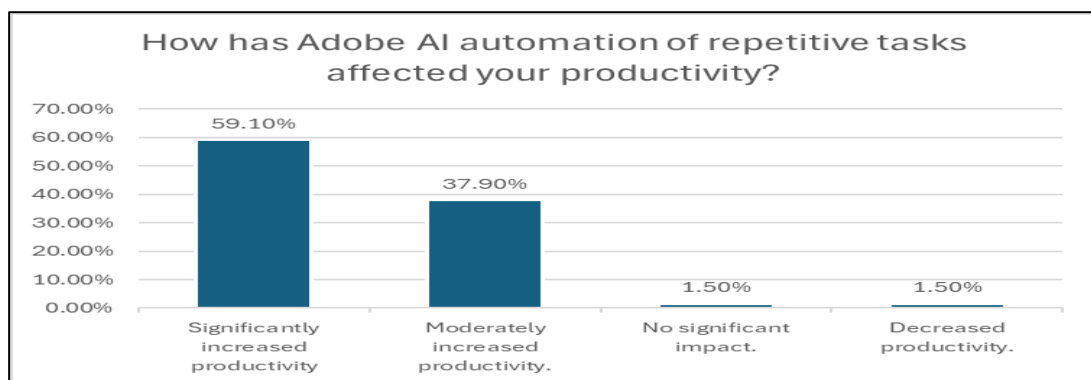


Figure 5: Impact of Adobe AI Automation on Designers' Productivity.

In terms of productivity, Adobe AI automation increases the productivity of 97% of designers: The finding suggests that the majority of designers (59.1%) have experienced a significant increase in productivity as a result of Adobe AI automation of repetitive tasks. This indicates that AI tools have effectively streamlined their workflow and allowed them to accomplish tasks more efficiently. Additionally, 37.9% of designers reported a moderate increase in productivity, further highlighting the positive impact of AI automation. However, it's worth noting that a small percentage (1.5%) stated that they have experienced no significant impact or even a decrease in productivity. This could be attributed to various factors such as the complexity of tasks, individual proficiency with AI tools, or specific project requirements. Overall, the data suggests that Adobe AI automation has largely contributed to enhancing productivity among designers, with only a minimal proportion reporting negative effects.

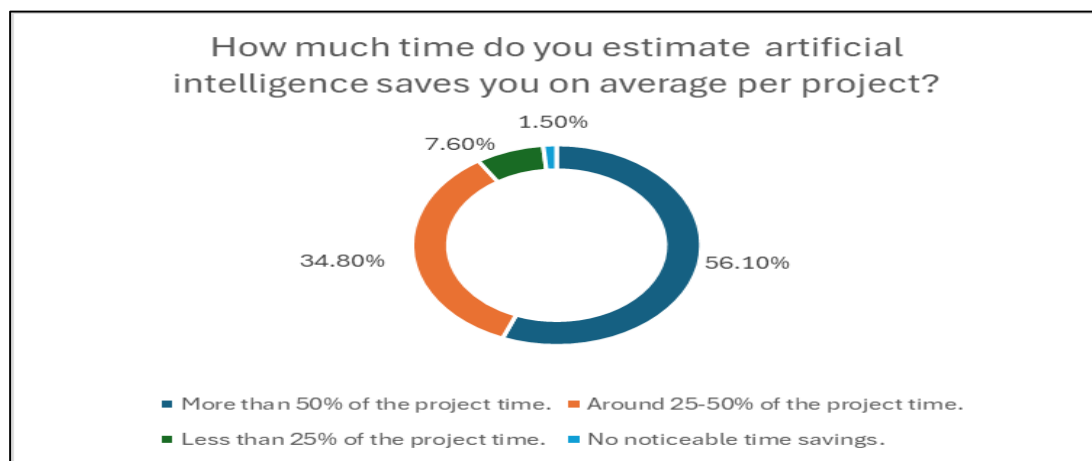


Figure 6: Saving time per project with AI.

AI assistance aids designers in saving time on their projects. Specifically, 56.1% reported saving more than half of the project time, while 34.8% showed a time reduction ranging between a quarter and half of the total project time. However, it's noteworthy that only a small percentage (1.5%) of respondents reported not experiencing any time savings with AI.

AI DATA-DRIVEN INSIGHTS, AI CREATIVE SUGGESTIONS, AND AI CONTENT-AWARE TOOLS IN GD

AI data-driven insights in GD: refer to the use of artificial intelligence (AI) algorithms to analyze large volumes of data related to design trends, user preferences, and performance metrics. By processing this data, AI can provide designers with valuable insights and recommendations to inform their design

decisions. These insights may include information on color preferences, typography trends, layout effectiveness, audience engagement metrics, and more. Given the role of data in data-driven insight generation, veracious data could ease exact analyses and, subsequently, data-driven insight (Ghasemaghaei and Calic, 2019). By using AI-driven insights, designers can create more informed and effective designs that better resonate with their target audience.

AI creative suggestions in GD: refer to the automated recommendations and ideas generated by AI algorithms to help designers in their creative process. These include algorithm recognition, natural language processing, machine learning, and computer vision. Together, these techniques enable computers to reason, learn, and act similarly to humans. (Zhang, Lu 2021). These suggestions can include design elements, color palettes, typography choices, layout options, and other creative aspects based on the input provided by the designer and the underlying patterns and trends identified by the AI system. The goal is to enhance the designer's workflow, inspire new ideas, and streamline the design process by using the power of machine learning and data analysis.

AI content-aware tools in GD: are software applications powered by artificial intelligence that analyze and understand the content of images, text, or other media elements in a design project. These tools are the most used by graphic designers who use Adobe software, they can automatically detect and identify various components within the content, such as objects, shapes, colors, textures, and patterns. Once the content is analyzed, AI algorithms can perform various tasks, including:

- 1- Content-aware resizing: Automatically resizing images while preserving important visual elements and minimizing distortion.
- 2- Object removal: Seamlessly removing unwanted objects or elements from images without leaving visible traces.
- 3- Content-aware filling: Automatically filling in missing or obscured areas in images by extrapolating content from surrounding areas.
- 4- Image retouching: Enhancing the quality of images by intelligently adjusting brightness, contrast, colors, and other visual attributes.
- 5- Text recognition and editing: Identifying text within images and allowing users to edit, format, or translate text directly within the design software.

Overall, AI content-aware tools aim to streamline the design process, save time, and improve the quality of graphic design projects by automating repetitive tasks and providing intelligent solutions for content manipulation and enhancement.

The following three graphs analyze the effects of AI data-driven insights, AI creative suggestions, and AI content-aware tools on graphic design productivity, innovative ideas, and design quality.

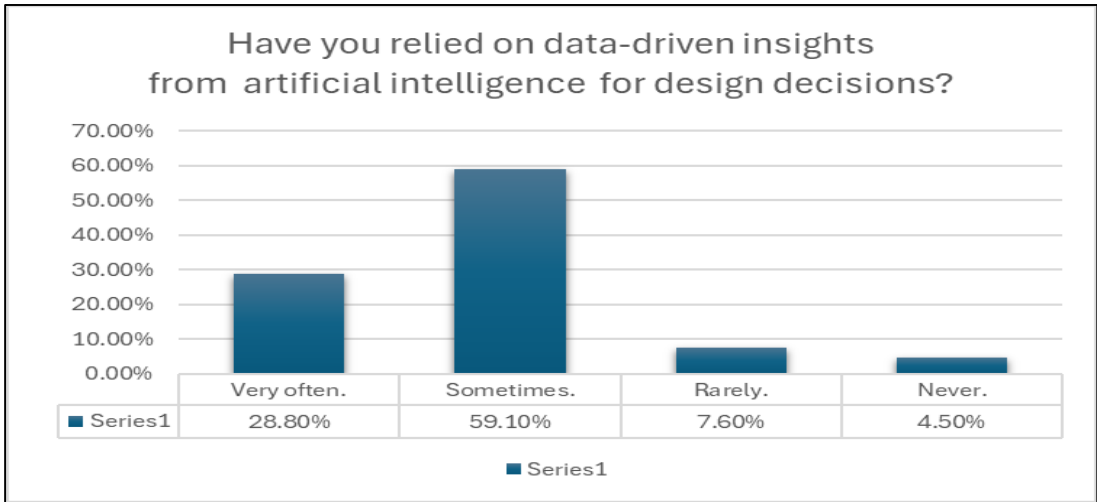


Figure 7: Reling on AI data-driven insights.

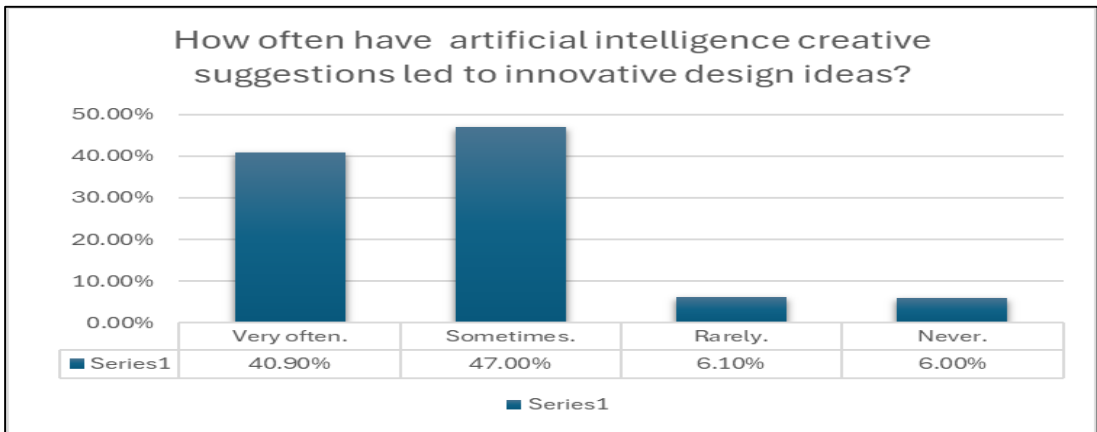


Figure 7: AI creative suggestions leading to innovative design ideas.

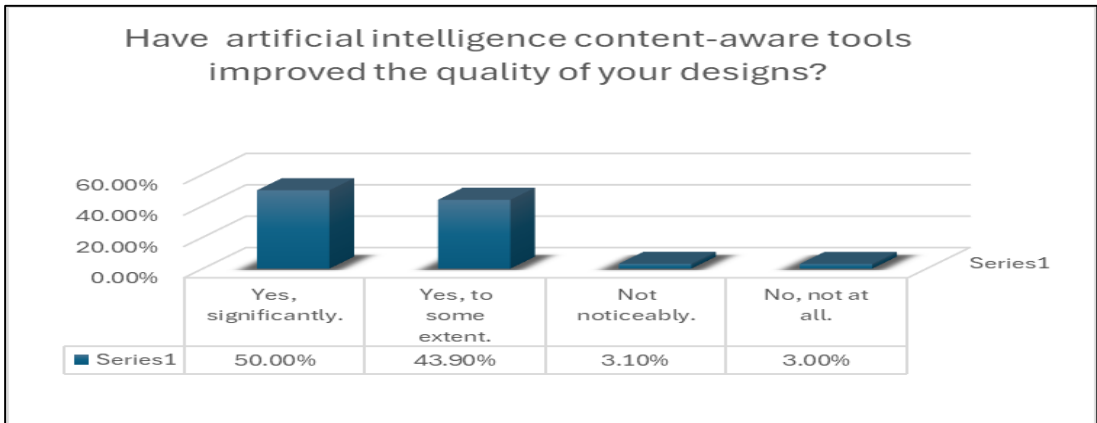


Figure 8: AI content-aware tools improve the design quality.

We can infer three important findings from the three earlier graphs: 87.9% of designers depend on AI data-driven insights, the same percentage (87.9%) utilize AI creative suggestions, and 93.9% employ AI content-aware tools in their graphic design projects. These tools are used to enhance productivity and design quality in their projects. These findings show a widespread integration of AI technologies into the GD process. The high percentages across all three categories suggest that AI data-driven insights, creative suggestions, and content-aware tools are extensively relied upon by designers in their projects.

The reliance on AI data-driven insights reflects a trend towards data-driven decision-making in GD, where designers use AI algorithms to analyze data and inform their design choices. This can lead to more informed and targeted design solutions tailored to specific audiences or aims. Similarly, the use of AI creative suggestions highlights the role of AI in augmenting designers' creativity and ideation process. By providing suggestions and generating ideas, AI tools can help designers explore modern design directions and concepts more efficiently. Furthermore, the widespread use of AI content-aware tools underscores their importance in enhancing design quality and efficiency. These tools enable designers to manipulate and adapt content seamlessly, leading to smoother workflows and more polished design outcomes.

Overall, these findings suggest that AI technologies have become integral to the GD process, offering designers valuable insights, creative inspiration, and tools for content manipulation.

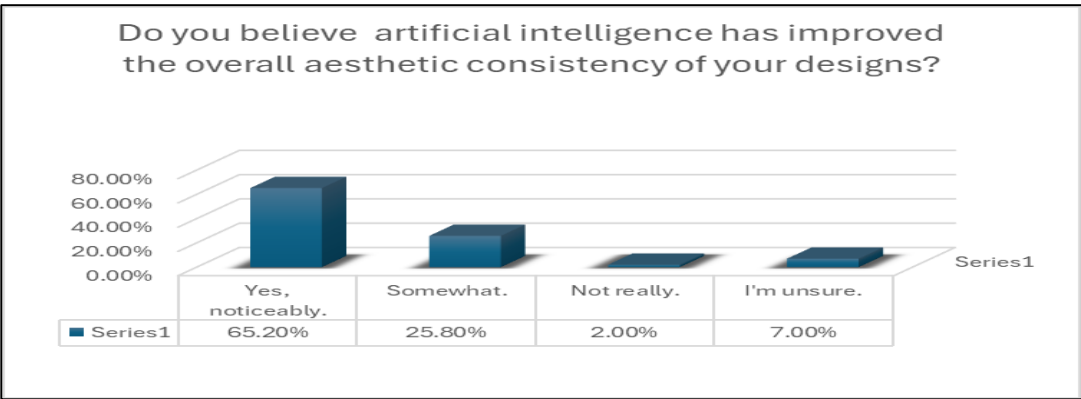


Figure 9: The overall aesthetic consistency of designs is enhanced by the use of AI.

The aesthetic consistency of GD refers to the coherence and harmony of visual elements within a design. This is a purely human capability that relies on the creativity and experience of the graphic designer. It involves ensuring that various design elements such as color, typography, imagery, layout, and composition work together effectively to convey a unified message or evoke

a particular emotional response. Consistency in aesthetics helps create a cohesive and polished look across distinctive design elements within a project or brand, reinforcing brand identity and enhancing visual communication effectiveness. It involves keeping a balance between creativity and coherence to ensure that the design effectively captures the intended audience's attention and communicates the desired message clearly and memorably. The findings of this graph are surprising, as we assumed that AI cannot replace human creativity. However, 91% of respondents stated that AI has improved the overall aesthetic consistency of their designs. Among them, 65.2% said that it noticeably enhances their design aesthetic consistency.

IMPACT OF AI-AAG ON GD JOB FROM DESIGNERS' PERSPECTIVE

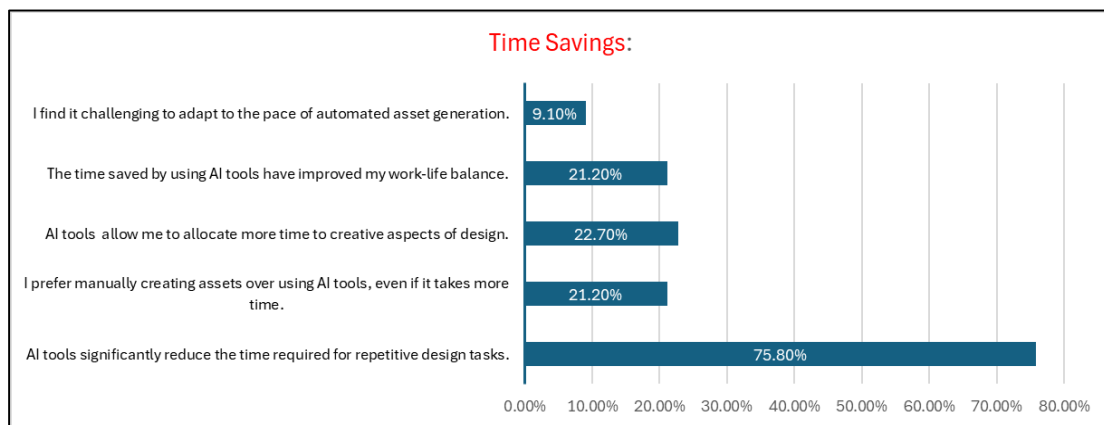


Figure 10: Time savings through the use of AI tools.

These findings shed light on the impact of AI tools on the efficiency, creativity, and work-life balance of designers:

- A significant majority of designers (75.8%) reported that AI tools have significantly reduced the time required for repetitive design tasks. This indicates that AI automation plays a crucial role in streamlining workflows and increasing productivity by handling routine tasks more efficiently.
- A notable proportion of designers (21.2%) expressed a preference for manually creating assets over using Adobe AI tools, even if it takes more time. This suggests that while AI tools offer time-saving benefits, some designers may prioritize maintaining full control over the design process and prefer the hands-on approach of manual creation.
- On the other hand, a similar percentage of respondents (22.7%) mentioned that Adobe AI tools allow them to allocate more time to the creative aspects of design. This highlights how AI automation can free up designers' time to focus on higher-level creative tasks, such as ideation and concept development.
- Another subset of designers (21.1%) stated that the time saved by using Adobe AI tools has improved their work-life balance. This suggests that AI

automation not only enhances productivity but also allows designers to achieve a better balance between their professional and personal lives by reducing time spent on repetitive tasks.

- However, a small percentage of designers (9.1%) admitted finding it challenging to adapt to the pace of automated asset generation. This indicates that while AI tools offer numerous benefits, some designers may encounter difficulties in adjusting to the speed and efficiency of automated workflows, possibly due to a learning curve or personal preferences.

Overall, these findings highlight the multifaceted impact of AI tools on designers, with benefits including increased efficiency, enhanced creativity, and improved work-life balance, alongside challenges related to adaptation and preference for manual creation.

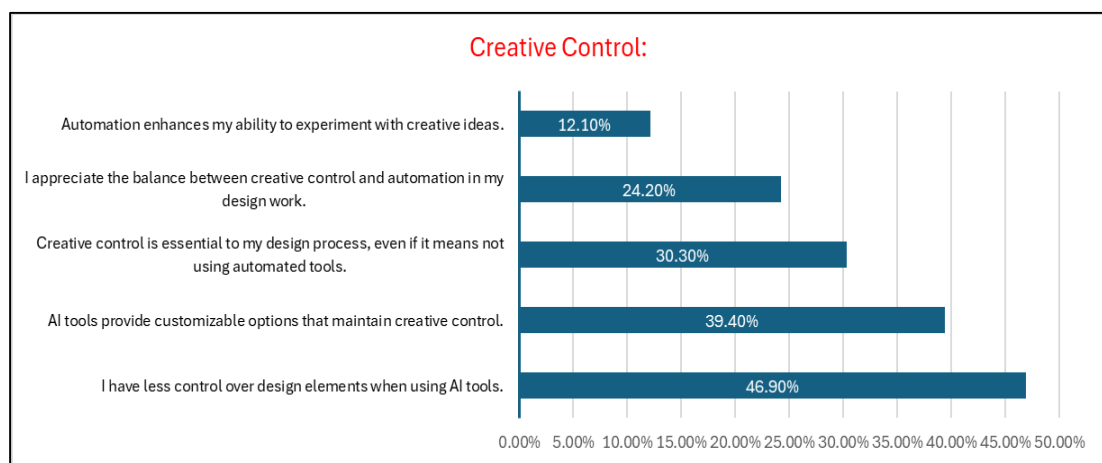


Figure 11: impact of AI tools on creative control capabilities.

These findings reveal a diverse range of perspectives among designers regarding the balance between creative control and automation in their design process.

- Nearly half of the designers (46.9%) expressed concerns about having less control over design elements when using Adobe AI tools. This suggests that some designers may feel that AI tools limit their ability to execute their creative vision precisely.

- However, a massive part (39.4%) stated that Adobe AI tools offer customizable options that allow them to maintain creative control. This shows that while AI may automate certain aspects of the design process, designers still value the ability to customize and fine-tune their designs according to their preferences.

- A third of the respondents (33.3%) emphasized the importance of creative control in their design process, even if it means forgoing the use of automated tools. This highlights the strong preference among some designers for keeping hands-on control over every aspect of their designs.

- On the other hand, a smaller percentage (24.2%) appreciated the balance between creative control and automation in their design work. This suggests that some designers see value in using automation for certain tasks while

keeping control over others, striking a balance between efficiency and creative freedom.

- Lastly, a minority of designers (12.1%) expressed that automation enhances their ability to experiment with creative ideas. This shows that for some designers; AI tools may serve as a catalyst for exploring new design concepts and pushing the boundaries of their creativity.

Overall, these findings underscore the complex relationship between creative control and automation in graphic design, with designers holding varied perspectives on the extent to which AI should be integrated into their workflow.

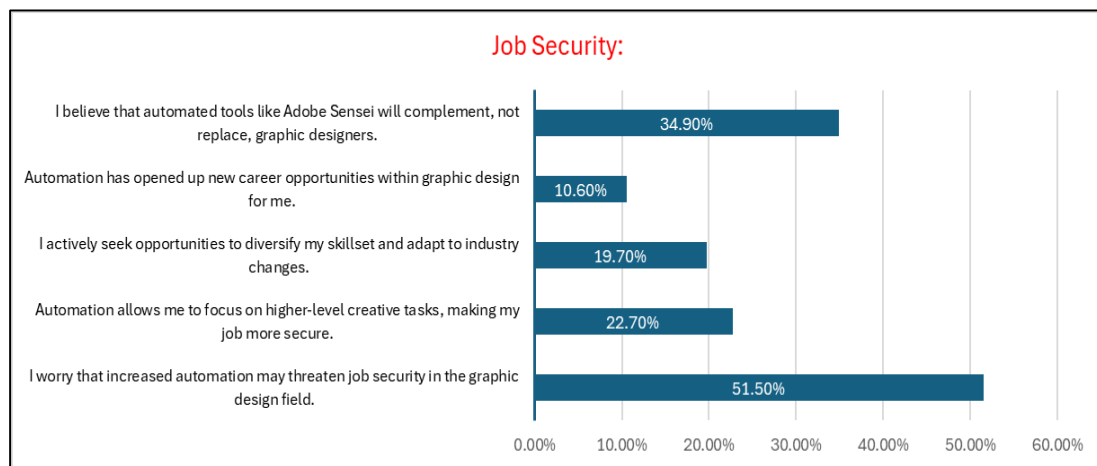


Figure 12: Job security from the perspective of designers.

Job security from the perspective of designers is an important aspect to consider in the context of technological advancements, particularly with the integration of AI tools in graphic design. The findings from our survey reveal various insights:

- **Concerns about Job Security:** Over half of the respondents (51.5%) expressed worries that increased automation may threaten job security in the graphic design field. This shows a significant level of apprehension among designers regarding the potential implications of automation for their employment stability.
- **Focus on Higher-Level Creative Tasks:** On the other hand, 22.7% of respondents mentioned that automation allows them to focus on higher-level creative tasks, which in turn makes their job more secure. This suggests that some designers view automation to streamline repetitive tasks, freeing up time and resources to concentrate on more strategic and innovative aspects of their work.
- **Adaptation to Industry Changes:** A notable proportion (19.7%) of designers reported actively seeking opportunities to diversify their skillset and adapt to industry changes. This shows a proactive approach among some designers in response to the evolving landscape of graphic design, recognizing the

importance of staying abreast of technological advancements and embracing new opportunities for skill development.

- **New Career Opportunities:** A smaller percentage (10.6%) of respondents mentioned that automation has opened new career opportunities within graphic design for them. This suggests that some designers perceive automation as a catalyst for expanding their professional horizons and exploring novel avenues within the field.

- **Complementarity of Automated Tools:** A significant majority (34.9%) of respondents believe that automated tools like Adobe Sensei will complement, rather than replace, graphic designers. This shows a nuanced understanding among designers regarding the role of automation, recognizing it as a supportive tool that enhances their capabilities rather than usurping their role entirely.

Overall, these findings highlight the complex and multifaceted nature of designers' beliefs about the impact of automation on job security in the graphic design field. While concerns about job displacement exist, there is also recognition of the potential benefits of automation in enabling designers to focus on higher-level creative tasks and adapt to changing industry dynamics.

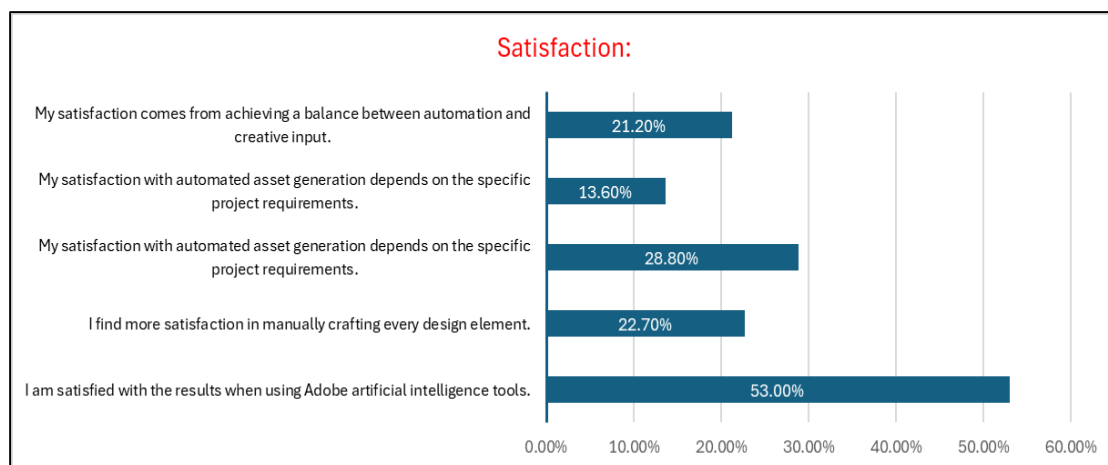


Figure 13: Designers' satisfaction with the use of AI.

These findings reflect a nuanced perspective among designers about their satisfaction with the use of Adobe AI tools. While a majority (53%) express satisfaction with the results achieved through these tools, a significant portion (22.7%) still find more satisfaction in manually crafting every design element. This suggests a divergence in preferences and working styles among designers.

Additionally, a third (28.8%) of respondents show that their satisfaction with automated asset generation depends on the specific project requirements. This highlights the contextual nature of satisfaction with AI tools, showing

that designers may value automation differently based on the nature and complexity of the project at hand.

Furthermore, a notable proportion (13.6%) report experiencing a sense of accomplishment when effectively using automated tools. This suggests that for some designers, mastering and efficiently using AI-driven workflows contributes to their professional fulfillment and sense of achievement.

Lastly, a considerable part (21.2%) express satisfaction derived from achieving a balance between automation and creative input. This underscores the importance of integrating automated tools into the design process in a way that complements human creativity and expertise rather than replacing it entirely.

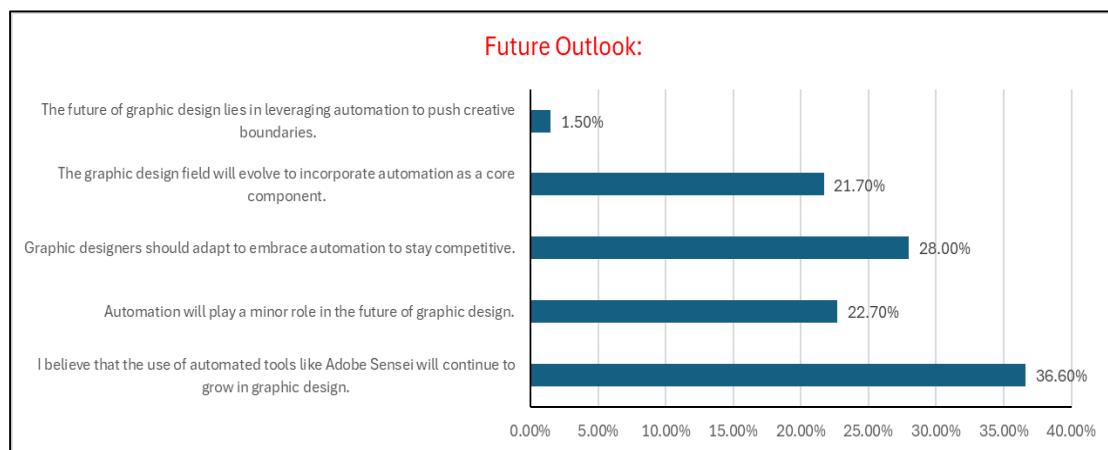


Figure 14: Future outlook regarding the use of AAG from designers' perspective.

These findings reflect diverse perspectives among designers about the future of AAG in GD.

- The largest percentage (36.60%) of designers believe that the use of automated tools like Adobe Sensei will continue to grow in the field. This shows optimism about the increasing integration of automation in graphic design processes.
- Conversely, 22.70% of respondents believe that automation will play a minor role in the future of graphic design. This suggests a more conservative view, perhaps showing skepticism or uncertainty about the extent to which automation will impact the industry.
- A significant portion (28.00%) of designers believe that graphic designers should adapt to embrace automation to stay competitive. This viewpoint underscores the importance of embracing technological advancements to remain relevant in the evolving landscape of GD.
- Another substantial percentage (21.70%) believes that the GD field will evolve to incorporate automation as a core part. This perspective suggests an

expectation that automation will become an integral part of GD processes rather than just an optional tool.

- Lastly, a small percentage (1.50%) of respondents believe that the future of graphic design lies in using automation to push creative boundaries. This suggests a forward-thinking outlook, envisioning automation as a catalyst for innovation and creative exploration in GD.

IMPACT OF AI-AAG ON THE ETHICS OF THE GD PROFESSION

The final segment of the survey delves into the implications of AI-AAG on ethics within the GD field. It looks to uncover the influence of AI-AAG on ethical practices in GD, identify the ethical considerations linked to the utilization of automated design tools like Adobe Sensei, and explore the potential positive ethical implications stemming from AI-AAG in GD.

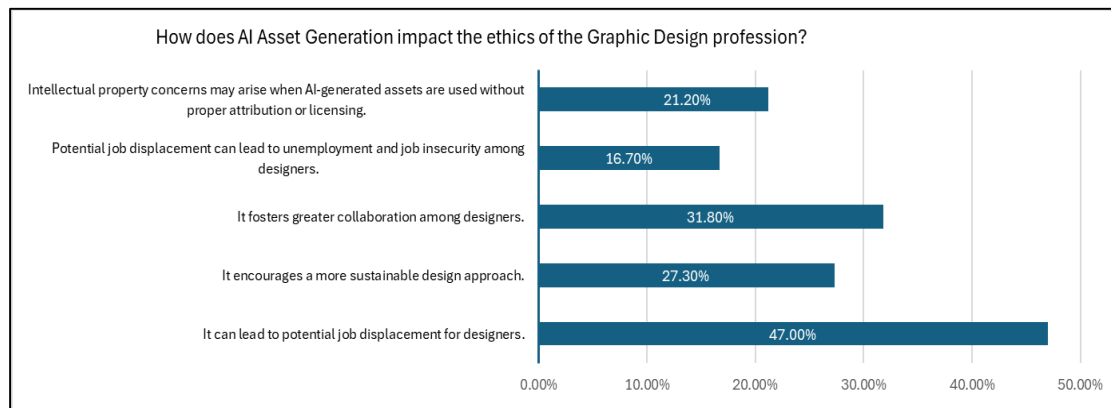


Figure 15: Impact of AI-AAG on the GD profession ethics.

These findings shed light on various perspectives regarding the impact of AI-AAG on the GD profession:

- **Job Displacement:** Nearly half of the designers (47%) expressed concerns about AI-AAG potentially leading to job displacement within the industry. This reflects apprehensions about the automation of design tasks potentially rendering certain roles redundant.
- **Sustainability:** A notable percentage of respondents (27.3%) see AI-AAG as promoting a more sustainable design approach. This suggests that some designers perceive AI-powered automation as a means to streamline processes and reduce waste in design workflows.
- **Collaboration:** A significant proportion of designers (31.8%) believe that AI-AAG encourages greater collaboration among designers. This indicates that automated design tools may facilitate teamwork and knowledge sharing within design teams.
- **Job Insecurity:** Some respondents (16.7%) highlighted the potential negative consequences of job displacement, such as unemployment and job

insecurity among designers. This reflects concerns about the socio-economic implications of widespread adoption of AI-AAG in the industry.

- **Intellectual Property:** A portion of designers (21.2%) raised concerns about intellectual property issues related to AI-generated assets. This underscores the importance of addressing legal and ethical considerations surrounding the use of AI-generated content, particularly regarding attribution and licensing.

Overall, these findings illustrate the complex interplay between technological innovation, ethical considerations, and socio-economic factors in the graphic design profession amidst the rise of AI-AAG.

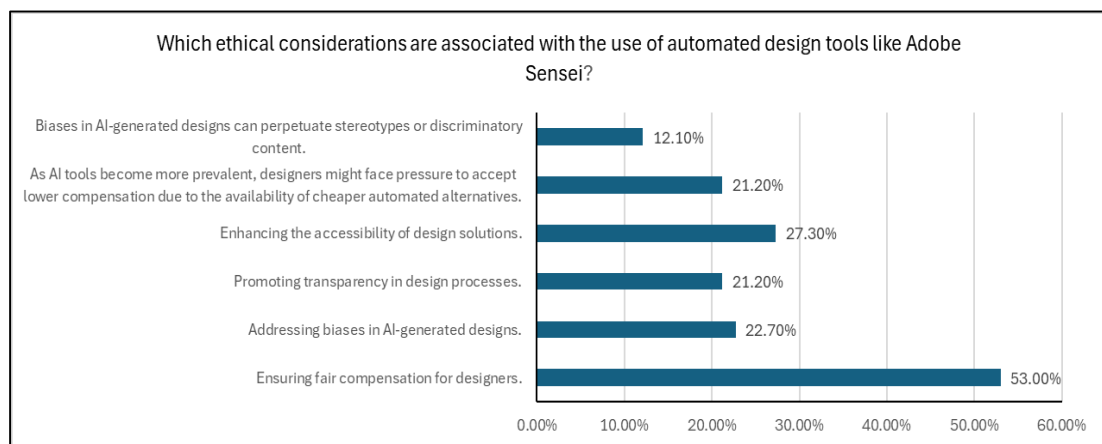


Figure 16: Ethical considerations associated with the use of AI-AAG.

These findings highlight several key ethical considerations associated with the use of automated design tools like Adobe Sensei:

- **Ensuring Fair Compensation:** The majority of designers (53%) emphasized the importance of ensuring fair compensation for designers. This reflects concerns about potential economic implications, such as devaluation of design work or exploitation of designers, in the context of increased reliance on automated tools.
- **Addressing Biases:** A significant portion of respondents (22.7%) identified the need to address biases in AI-generated designs. This indicates concerns about the potential perpetuation of stereotypes or discriminatory content by AI algorithms, highlighting the importance of mitigating biases in automated design processes.
- **Promoting Transparency:** A notable percentage of designers (21.2%) emphasized the importance of promoting transparency in design processes. This suggests a desire for clear and open communication regarding the use of AI tools in design workflows, as well as transparency in how AI algorithms operate and make design decisions.
- **Enhancing Accessibility:** Some respondents (27.3%) highlighted the potential of AI tools to enhance the accessibility of design solutions. This reflects optimism about the role of automation in making design tools more

accessible and inclusive, potentially democratizing design processes and lowering barriers to entry for aspiring designers.

- **Economic Pressures:** A portion of designers (21.2%) expressed concerns about economic pressures resulting from the prevalence of AI tools. This includes worries about downward pressure on compensation for designers due to the availability of cheaper automated alternatives, highlighting the need to address potential inequalities in the design industry.

Overall, these findings underscore the multifaceted ethical considerations surrounding the use of automated design tools in the graphic design profession, emphasizing the importance of fair compensation, bias mitigation, transparency, accessibility, and economic equity.

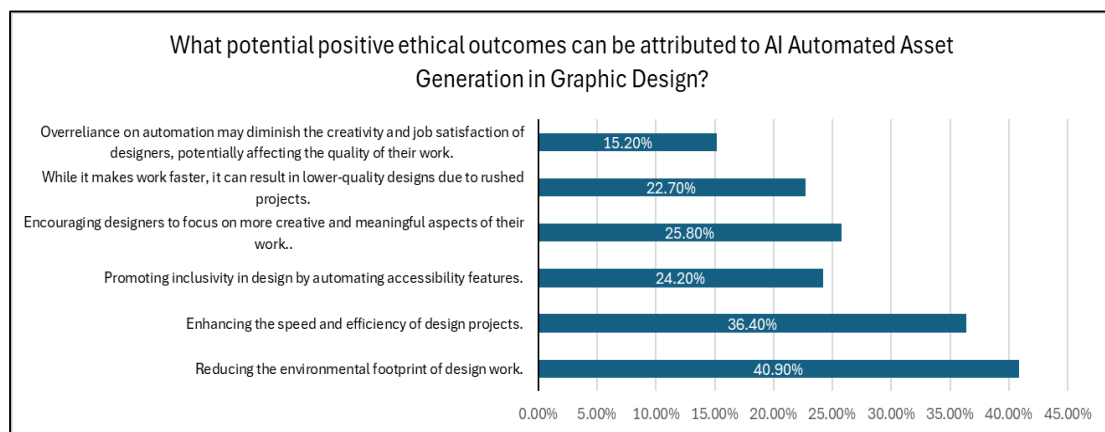


Figure 17: Potential positive ethical outcomes attributed to AAG in GD.

The findings of this graph shed light on the beliefs of graphic designers about the potential ethical outcomes of AAG in graphic design. By analyzing responses to questions about reducing environmental impact, enhancing efficiency, promoting inclusivity, encouraging creativity, and addressing concerns about rushed projects and job satisfaction, we gain insight into the multifaceted ethical considerations surrounding the adoption of AI-powered design tools.

- **Reducing the environmental footprint:** 40.9% of designers see AAG to reduce the environmental impact of design work. This suggests that automated tools may lead to more sustainable design practices by minimizing resource consumption.

- **Enhancing speed and efficiency:** 36.4% of designers believe that AAG can improve the speed and efficiency of design projects. This shows that AI tools like Adobe Sensei have the potential to streamline workflows and increase productivity.

- **Promoting inclusivity:** 24.2% of designers mention the promotion of inclusivity in design by automating accessibility features. This suggests that automated tools can help designers create more accessible designs, ensuring that they are usable by a wider range of people.

- **Encouraging focus on creativity:** 25.8% of designers see AAG to encourage designers to focus on more creative and meaningful aspects of their work.

This implies that automation can free up time for designers to engage in more innovative and strategic design activities.

- Concerns about rushed projects: 22.7% of respondents express concern that while automation speeds up work, it may lead to lower-quality designs due to rushed projects. This highlights the importance of keeping quality standards even in fast-paced workflows.
- Potential impact on creativity and job satisfaction: 15.2% of designers worry that overreliance on automation could diminish creativity and job satisfaction, potentially affecting the quality of work. This indicates a need to strike a balance between automation and human creativity in the design process.

CONCLUSION

In this article, we have explored AI's role in GD by examining its current applications and highlighting examples of Adobe Sensei AI-powered tools. We have also discussed the limitations of AI, explaining why it is not yet capable of replacing graphic designers, although this potential may appear in the future. Lastly, we will delve into the future of AI in GD, discussing its potential evolution in the years ahead and how it could become a valuable and productive tool for graphic designers, rather than posing a threat.

One of the primary reasons why AI still cannot fully replace graphic designers is due to the innate creativity, intuitive thinking, and abstract reasoning ability owned by human designers. While AI can swiftly generate many design proposals based on trends and predefined models within seconds, it lacks the ability for genuine creative initiative. In other words, AI is unable to be truly imaginative and original, to read between the lines and infuse designs with authentic human creativity. A graphic designer can craft an illustration or logo that narrates a story, communicates implicit messages, evokes specific emotions, and authentically embodies the culture and values of a brand. These nuanced aspects of design cannot be captured and replicated by a mere algorithm.

The extensive analysis of findings in this research, about AI-AAG in GD underscores its transformative potential and ethical implications. Designers acknowledge the significant benefits of AI-powered tools in enhancing productivity, creativity, and efficiency. However, concerns about job displacement, quality control, and ethical concerns are significant. While AI-AAG offers immense opportunities, its responsible and ethical use is paramount to safeguarding the integrity of the graphic design profession.

It is important to address the following points, which encompass the key issues to be explored for potential recommendations:

- Developing an AI capable of understanding a customer's issue, showing relevant products in a catalog, and rendering them accurately on screen poses a significant challenge.
- Human designers are considered indispensable in scenarios requiring nuanced comprehension and personalized solutions.
- AI may struggle to replicate the intuitive and empathetic understanding that human designers bring to customer interactions.
- The complexity of understanding diverse customer needs and accurately translating them into visual solutions underscores the continued relevance of human creativity in design processes.
- The impact of AI on the field of GD will undoubtedly be gradual and progressive. During such technological shifts, it's crucial not to resist change, as doing so may lead to delaying the inevitable and creating a significant disparity between GD work practices and the evolving demands of the profession as these technologies become ubiquitous.
- It is undeniable that the advent of computer tools disrupted creative professions, leading to the rapid disappearance of many roles as computers offered the capability to perform tasks faster.
- It is conceivable that AI may trigger a similar phenomenon. However, we must approach the role of AI in creative professions with caution. Like code, AI will become a tool that we adopt, change, and influence without replacing the designer and their ability.
- AI and graphics are a powerful partnership. From AI-assisted design to automated creation, AI is revolutionizing the world of GD. By staying at the forefront of these advancements, GD professionals can not only become more efficient but also boost their creativity for even more impressive results.

RECOMMENDATIONS

- 1- Comprehensive Education: Develop comprehensive educational programs to equip designers with the necessary skills to effectively use AI-AAG tools while understanding their ethical implications. This is by introducing courses on AI user ethics in GD curricula is vital, educating students on using AI tools responsibly for inspiration and efficiency while understanding limits to prevent the proliferation of deep fakes and falsified design productions.
- 2- Collaborative Efforts: Foster collaboration among designers, AI developers, and industry stakeholders to set up ethical guidelines and standards for the use of AI in GD.
- 3- Transparency and Accountability: Ensure transparency in AI algorithms and design processes to mitigate biases and promote accountability for ethical practices.
- 4- Quality Assurance: Prioritize quality assurance measures to keep design standards and creativity despite the efficiency offered by AI-AAG tools.
- 5- Continuous Monitoring: Implement mechanisms for continuous monitoring and evaluation of AI-AAG tools to address emerging ethical concerns and adapt to evolving technological landscapes.

By implementing these recommendations, stakeholders can harness the potential of AI-AAG in GD while upholding ethical standards and protecting the interests of designers and society at large.

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