

## Generative AI in Social Media Marketing: An Evaluation of Adobe Firefly

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### ARTICLE HISTORY

**Paper Nomenclature:** Theme Based Paper (TBP)  
**Paper Code:** GJEISV16I3JS2024TBP1  
**Submission at Portal (www.gjeis.com):** 12-July-2024  
**Manuscript Acknowledged:** 19-July-2024  
**Originality Check:** 22-July-2024  
**Originality Test (Plag) Ratio (Drillbit):** 01%  
**Author Revert with Rectified Copy:** 26-July-2024  
**Peer Reviewers Comment (Open):** 31-July-2024  
**Single Blind Reviewers Explanation:** 12-Aug-2024  
**Double Blind Reviewers Interpretation:** 15-Aug-2024  
**Triple Blind Reviewers Annotations:** 26-Aug-2024  
**Author Update (w.r.t. correction, suggestion & observation):** 15-Sept-2024  
**Camera-Ready-Copy:** 18-Sept-2024  
**Editorial Board Excerpt & Citation:** 28-Sept-2024  
**Published Online First:** 30-Sept-2024

### ABSTRACT

**Purpose:** In today's technological environment, generative artificial intelligence (AI) is advancing at a faster pace and is increasingly being adopted across various business processes, particularly in social media marketing. Adobe Firefly, Adobe's generative AI solution, is promoted as capable of generating high quality images and also improving the existing ones, simply based on the clearly defined text-based user prompts. The current research article evaluates the generative capabilities of Adobe Firefly and its application in social media marketing strategies. It also evaluates how Adobe Firefly bridges the gap between imagination and output through experimentation, discusses advantages and limitations of this generative AI solution, specifically concerning the copyright issues associated with image generation.

**Design/Methodology/Approach:** The study adopts a qualitative approach through mixed methods, including desk research methodology and experimentation, collecting data from existing literature and official sources, including Adobe Firefly's official websites and blogs, and other relevant and reliable sources of information, such as Harvard Business Review and MIT Technology Review.

**Findings:** The images generated by Adobe Firefly based on text prompts are impressive but struggle significantly with text clarity, often resulting in distorted angles, particularly in generated images of laptops for ad purposes. While the vibrant backgrounds are suitable for social media marketing, the difficulty in producing clear text can hinder marketers, as contact details are essential for driving sales. Currently, Firefly can be effectively used for generating product images and appealing backgrounds, but the output will require editing for final enhancements before posting on social media.

**Originality:** This paper uniquely evaluates Adobe Firefly's generative AI capabilities in social media marketing, addressing both its transformative potential and the associated challenges.

**Paper Type:** Theme Based Paper

**KEYWORDS:** Generative AI | Social Media Marketing | Adobe Firefly | Desk Research | Marketing Best Practices

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- Present Volume & Issue (Cycle): Volume 16 | Issue-3 | Jul-Sept 2024
- International Standard Serial Number:  
Online ISSN: 0975-1432 | Print ISSN: 0975-153X
- DOI (Crossref, USA) <https://doi.org/10.18311/gjeis/2024>
- Bibliographic database: OCLC Number (WorldCat): 988732114
- Impact Factor: 3.57 (2019-2020) & 1.0 (2020-2021) [CiteFactor]
- Editor-in-Chief: Dr. Subodh Kesharwani
- Frequency: Quarterly
- Published Since: 2009
- Research database: EBSCO <https://www.ebsco.com>
- Review Pedagogy: Single Blind Review/ Double Blind Review/ Triple Blind Review/ Open Review
- Copyright: ©2024 GJEIS and it's heirs
- Publishers: Scholastic Seed Inc. and KARAM Society
- Place: New Delhi, India.
- Repository (figshare): 704442/13

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## Introduction

Given the dynamic nature of social media marketing space, technological innovations continue to build the new ways in which businesses engage with their audience and promote their brands. Among such advancements, Generative Artificial Intelligence (AI) stands out as a revolutionary tool, offering remarkable capabilities in content creation, personalization, and audience engagement. Given this scenario, Adobe Firefly emerges as a powerful platform at the intersection of generative AI and social media marketing, helping marketers to build dynamic, visually appealing ads to attract the audience of this digital age, just with a text based prompt with the results being generated in a span of moments.

Generative AI represents a game-changing shift in content creation, which enables machines to generate original, contextually relevant content all by themselves. By utilizing deep learning algorithms and natural language processing techniques, generative AI platforms like Adobe Firefly can produce a wide range of multimedia content, including images, videos, and text, with remarkable speed and precision. This capability holds immense potential for social media marketers to seek and capture the attention of online audiences.

Adobe Firefly leads the technological revolution of social media marketing, providing tailored tools for professionals. Its user-friendly interface and robust functionality help marketers craft compelling narratives, spanning dynamic video ads to immersive augmented reality experiences, thereby enhancing social media presence and fostering meaningful engagement with the audience.

## Review of literature

The exploration of modern technologies in social media marketing reveals significant insights into the evolving landscape of digital marketing strategies. Recent literature highlights the transformative role of artificial intelligence (AI), the Internet of Things (IoT), and augmented reality (AR) in enhancing marketing efforts on social networking platforms. For instance, a study conducted by Chaudhary et al. (2023) emphasizes how these technologies can be leveraged to optimize marketing practices, presenting a comprehensive analysis based on both primary and secondary data. The primary data was sourced from 46 marketing executives across various organizations that utilize social media as a marketing tool, showcasing the practical implications of these technologies in real-world scenarios.

Further examination by Appel et al. (2019) delves into the future of social media within the marketing domain, proposing nine thematic predictions regarding its impact on consumers, industry dynamics, and public policy.

This research integrates academic insights with industry perspectives, effectively forecasting trends that will shape marketing practices in the immediate and distant future. The authors provide a foundation for future research directions, underscoring the necessity for ongoing adaptation in marketing strategies as social media continues to evolve.

Additionally, Mulgai (2018) argues that AI represents a secure investment with substantial returns in the context of digital marketing. The past decade has witnessed remarkable advancements in information technology that have fundamentally altered global business operations and societal interactions. Mulgai points out that emerging technologies—such as data analytics, mobile devices, and automation—are reshaping how businesses engage with consumers. This transformation is particularly evident in digital marketing sectors where AI-driven solutions are facilitating unprecedented changes, enhancing efficiency and productivity.

## Research gap and objectives

Upon reviewing the literature, it was noted that there is no specific research addressing Adobe Firefly and its role in social media marketing. The current article evaluates how Adobe Firefly bridges the gap between imagination and output through experimentation, discusses advantages and limitations of this generative AI solution, specifically concerning the copyright issues associated with image generation.

## Methodology

The present study adopts a qualitative approach through mixed methods, including desk research methodology and experimentation, collecting data from existing literature and official sources, including Adobe Firefly's official websites and blogs, and other relevant and reliable sources of information, such as Harvard Business Review and MIT Technology Review.

## Adobe Firefly, a generative AI application, for social media marketing

In the ever-evolving tech landscape, 'Adobe Firefly' came as a revolutionary generative AI application created specifically for the innovative spirits of creators. Adobe.com says 'Adobe Firefly' as "a stand-alone generative AI web application available at [firefly.adobe.com](https://firefly.adobe.com). It offers new ways to ideate, create and communicate while significantly improving creative workflows using generative AI."

Launched on March 21, 2023, Adobe Firefly had already celebrated its first birthday by the time of writing this article.

In just one year of its launch, over 6.5 million images were produced using Adobe Firefly. (Alexandru Costin, 2024). The company says Adobe Firefly was developed keeping creators in mind, making it a creator-centric generative AI application. Alexandru Costin (2024) reveals that 83% of creative professionals are using generative AI tools, and 74% of them are using them in their personal lives as well.

Generative AI, short for Generative Artificial Intelligence, is an AI technology that generates original content, including text, images, videos and audio, based on user prompts. In the words of Adobe, “Generative AI is a type of artificial intelligence that creates new data, like images or text, by learning from existing data. It effectively visualizes and generates content to match what we describe and helps us to create, explore, and push boundaries, opening fresh avenues for imagination, experimentation, and bringing ideas to life.”

With the help of deep learning algorithms and neural networks, generative AI applications can analyze large amounts of data to identify trends, understand audience behavior, and generate content that matches specific demographics. This level of personalization allows marketers to create highly targeted messages and advertisements, maximizing the effectiveness of their social media campaigns and driving business outcomes.

Generative AI applications, like Adobe Firefly, can act as a personal assistant to marketers, it simplifies their routine tasks and adds creativity and freshness to their marketing materials. This innovative technology enables marketers to generate dynamic, engaging, compelling and even personalized content as per the preferences and interests of their target audience. It can help enhance brand visibility on the one hand and customer engagement on the other. This is possible with real-time chatbots and virtual assistants, fostering personalized customer support and product recommendations. Such dynamic interaction leads to strong brand-consumer relationships, enhances brand loyalty, and makes customers feel valued and heard.

So, in simple words, Adobe Firefly is a cloud-based generative AI application using which creators can create new content simply by giving it a text prompt. Adobe markets that with simple text prompts in over 100 languages, one can generate images, add or remove objects, transform text and so much more using Adobe Firefly. In addition to the web-based application, Adobe also offers a family of generative AI models, including the AI features of Adobe Firefly, on its other platforms or applications.

Adobe’s CEO, Shantanu Narayen, says the company has invested in AI and generative AI over the past decade. Adobe’s ongoing R&D investments enabled it to develop and deploy Adobe Firefly, which he calls “a copilot that augments

rather than replaces human ingenuity.” He says that it sparks creativity and refines ideas for creative minds globally. For businesses, it opens up opportunities for increased automation, productivity, and personalized experiences. He adds that they engaged Adobe’s customers in testing new features and watched even the most skeptical faces light up when they realized how much time they would save using AI-powered technology. (Shantanu Narayen (2023))

We feel that Adobe Firefly is a game changer in generating original images. Firefly comes with the following features as described on its official webpage:

1. **Text to Image** – With this feature, users can generate high quality new images based on a detailed text description, and at times, the image output can be shaped by providing a reference image to the application.
2. **Generative Fill** – Here, users can use a brush to remove or paint new objects. This feature is really interesting because, as the name suggests, it can fill the image content based on the context provided.
3. **Text Effects** – Another interesting and most useful feature. Using this, users can apply different styles and textures to their text in the images.
4. **Text to Template** – With this, one can generate ready-to-use or editable templates with just a detailed text prompt.
5. **Text to Vector Graphic** – Users can type-in a detailed text description to generate scalable vector graphics (SVGs) with this feature.
6. **Generative Recolor** – With this feature, users can generate color variations of their vector graphics.

Apart from the above features, the company is also exploring two other features – 3D to Image (generating images from the 3D elements’ interactive positioning) and Project Stardust (moving any object anywhere in the image).

Given the amazing capabilities of Adobe Firefly in generating images using the generative AI technology, social media marketers can leverage this generative AI application to their advantage as it can significantly boost revenue of businesses. Creating innovative and highly personalized images becomes easier for them, saving them a lot of time, money and energy. They can also see their productivity hitting new heights. The generative AI technology is still nascent and a lot of improvements are yet to come. However, the pace at which the technology is improving is impressive and can really create marketing-perfect images in the very near future. Such perfectly AI-generated images can directly be used as input for creating social media posts, saving a lot of time, money and energy for businesses so that they can focus on improving core business operations.

To evaluate the effectiveness of the Firefly-generated images for the social media marketing purposes, we logged onto Firefly’s official website and created images for an advertisement of a new laptop with basic default settings in its user interface as listed below. See Figure 1 for the generated images.

- Model: Firefly Image 3
- Aspect ratio: Square 1:1
- Content type: Art
- No reference
- Default visual intensity
- Effect: Popular
- Color, lighting and Camera angle: None
- Text Prompt given: Generate an image of a newly launched laptop for the purpose of social media marketing

**Figure 1: Adobe Firefly-generated images for a new laptop advertisement**



Source: Authors’ own

On primary analysis, the images generated by Firefly are quite impressive given that it has been generated purely based on text prompt. But it is clearly evident from the pictures that they have major issues with creating text within the images. 3 out of 4 images of laptops have been generated with distorted angles. However, evaluating the background behind the laptops are quite vibrant as well as sophisticated, suitable for the purpose of social media marketing.

As mentioned earlier, the model struggles with generating clear text in the images, which can be a drawback to the creators or marketers to remove the distorted text generated through putting extra efforts through editing the images. Also, most social media posts have contact details, which is an essential for driving business sales. Since text generation is the major issue here for now, the model can be used by the social media marketers in generating images of products (by giving a reference image) and beautiful backgrounds just in a few clicks.

Hence, at the present moment given the capabilities of current model of Adobe Firefly, the images generated by it can be taken for editing for polishing and finetuning the image to make it ready for posting onto the social media platforms.

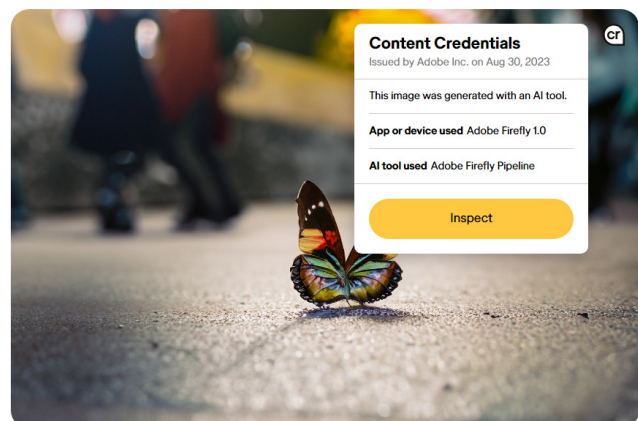
## Copyright concerns of AI-generated images

When it comes to generative AI, there are issues concerning with bias, incorrect information and intellectual property rights(IPRs). Adobe enables creators and businesses to both create and use AI-generated images, providing assurance regarding copyright concerns. The company assures that these images are safe for commercial use.

There were backlashes from various artists and creators that AI companies are using their artwork, without consent or compensation, to train their AI models. Adobe is following a different approach in this context. Adobe guarantees that Firefly is trained on Adobe Stock images and other images available on the internet that are either non-copyrighted or whose copyright has expired. Adobe also confirms that it has licenses for the images on which Firefly is trained. However, there is no specific mention of the exact model on which Firefly AI is built anywhere, including on its official websites.

To address copyright concerns, Adobe, along with the New York Times and Twitter (X), started the Content Authenticity Initiative (CAI), which promotes the use of labels to indicate whether content is AI-generated or not. Following this initiative, content credential pins (as ‘cr’ at the top) are attached to AI-generated images, which reveal important information about such images, including if the image was generated with an AI tool, the AI tool used to generate the image, the details of the producer (creator), and its history of edits or modifications. See Figure 2 below.

**Figure 2: AI-generated image displaying ‘cr’ pin on it**



Source: Official Website of Content Credentials

Content Credentials' official website describes that "content credentials are a new open technology for revealing answers to your questions about content with a simple click: How was it made? Is it AI-generated? When was it created or edited?" So, whenever we see a content credential pin attached to the top right of an image, we can click on the pin to reveal the image's information, proving transparency about its creator details, whether the image is fake or an original image, and decide whether to trust it or not. These pins will be viewable across the internet very soon.

Also, social media marketers should be alert if any fake and hateful image content is being generated. Hence, human oversight is important at all times when it comes to generating images using AI models, even with Adobe Firefly. If the cost of licensing these AI tools becomes accessible for small businesses and freelancers, then using Adobe Firefly can truly transform the social media marketing landscape.

## Conclusion

All of our discussion clearly hints that social media marketing is going to be different in the near future. Adobe Firefly has come out as a winner out of image generating AI models, when speaking from the angle of managing copyright concerns effectively. We will start seeing images generated by AI (with little "cr" (content credential) pins) hitting our news feeds. Social media marketers can reap significant benefits from using this tool or application, while also being aware and alert to misinformation challenges, which is inherent in generative AI applications including Adobe Firefly.

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### Annexure 16.3.3

Submission Date	Submission Id	Word Count	Character Count
22-July-2024	2988708 (DrillBit)	2912	20886

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2.1 TBP1_Ajay_GJEIS Jul to Sept 2024.docx	punnaajaykumar@osmania.ac.in	Punna Ajay Kumar	01%



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 C-Poor (41-60%)  
 D-Unacceptable (61-100%)

LOCATION	MATCHED DOMAIN	%	SOURCE TYPE
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2	www.microsoft.com	1	Publication

#### Reviewers Memorandum

**Reviewer’s Comment 1:** The paper provides a valuable evaluation of Adobe Firefly’s capabilities in social media marketing, but the analysis could be further strengthened by incorporating more empirical evidence. While the qualitative approach through desk research and experimentation is appropriate, it would enhance the study’s credibility to include insights from industry practitioners or case studies showcasing real-world applications. Additionally, expanding the discussion on how Firefly compares with other generative AI tools in terms of accuracy, efficiency, and usability would provide a more comprehensive evaluation.

**Reviewer’s Comment 2:** The paper touches upon copyright concerns related to AI-generated images, but this aspect requires deeper exploration. Given the increasing legal debates surrounding AI-generated content, a discussion on how Adobe Firefly handles intellectual property rights and its implications for marketers and businesses would add significant value. It would also be beneficial to examine any existing guidelines, terms of use, or potential legal risks businesses might face when using generative AI for commercial purposes.

**Reviewer’s Comment 3:** While the findings highlight the strengths and limitations of Adobe Firefly, the paper could provide more concrete recommendations for marketers and businesses looking to integrate this tool into their social media strategies. A discussion on how future AI advancements could address current limitations would also enhance the paper’s forward-looking perspective



Punna Ajay Kumar and Indrakanti Sekhar  
 “Generative AI in Social Media Marketing:  
 An Evaluation of Adobe Firefly”  
 Volume-16, Issue 3, Jul-Sept 2024. (www.gjeis.com)

<https://doi.org/10.18311/gjeis/2024>  
 Volume-16, Issue 3, Jul-Sept 2024

Online ISSN : 0975-1432, Print ISSN : 0975-153X  
 Frequency : Quarterly, Published Since : 2009

Google Citations: Since 2009  
 H-Index = 96  
 i10-Index: 964

Source: <https://scholar.google.co.in/citations?user=S47TtNkAAAAJ&hl=en>

**Conflict of Interest:** Author of a Paper had no conflict neither financially nor academically.

### Editorial Excerpt



The article has 1% of plagiarism which is the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks the paper had some minor revisions which were communicated on a timely basis to the authors (Ajay & Sekhar), and accordingly, all the corrections had been incorporated as and when directed and required to do so. The comments related to this manuscript are noticeably related to the theme "Generative AI in social media marketing: an evaluation of Adobe Firefly" both subject-wise and research-wise. In an era where generative AI is revolutionizing digital marketing, Adobe Firefly emerges as a promising tool for content creation. This research article critically examines Firefly's capabilities in social media marketing, highlighting its strengths in generating visually appealing images while addressing its challenges, particularly in text clarity and copyright concerns. Through a qualitative approach combining desk research and experimentation, the study offers valuable insights into how Firefly bridges the gap between creativity and AI-driven execution. This paper serves as an essential resource for marketers, businesses, and researchers exploring the evolving landscape of AI-powered content generation. After comprehensive reviews and the editorial board's remarks, the manuscript has been categorized and decided to publish under the "**Theme Based Paper**" category.

### Acknowledgement



The acknowledgement section is an essential part of all academic research papers. It provides appropriate recognition to all contributors for their hard work and effort taken while writing a paper. The data presented and analyzed in this paper by the author (Ajay and Sekhar) were collected first handily and wherever it has been taken the proper acknowledgment and endorsement depicts. The author is highly indebted to others who facilitated accomplishing the research. Last but not least, endorse all reviewers and editors of GJEIS in publishing in the present issue.

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