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The Impact of Generative Artificial Intelligence on the Design of Online Public Service Advertisements and Corresponding Strategies

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ABSTRACT

In order to explore the impact of generative artificial intelligence (AIGC) on the design of online public service advertisements and how to respond. The article first summarizes the current development status and characteristics of AIGC technology and online public service advertising, and then deeply analyzes the profound impact of generative artificial intelligence on the design and development of online public service advertising from different dimensions. Research has shown that while AIGC significantly improves the creative efficiency of advertising content and enriches creative inspiration, it may also lead to challenges such as design homogenization and unclear responsibility attribution. Overall, its positive impact is dominant. Based on this, the study proposes operational response strategies from four aspects: coping psychology, talent cultivation, technology application, and value ethics, in order to guide the high-quality development of online public service advertising design in technological iteration and provide theoretical and practical references for relevant practices.

KEYWORDS

generative artificial intelligence, AIGC, online public service advertisements, public service advertising, advertising design

INTRODUCTION

Online public service advertising refers to non-commercial advertising disseminated through the internet. It calls on the public to pay attention to a social issue by conveying a certain concept, to regulate their behavior in accordance with the principles of public interest, and to support or advocate a certain social cause or social trend. [1] The Internet serves as the medium for online public service advertisements, and any changes to it will affect the development of such advertisements. The Internet is developing rapidly and has been under-

going continuous evolution since its inception. In recent years, the rapid advancement of artificial intelligence technology and its application in the Internet have promoted huge changes in the social, economic and cultural fields. In particular, in 2022, technology companies represented by OpenAI released large artificial intelligence models such as ChatGPT, announcing that generative artificial intelligence (Artificial Intelligence Generated Content , abbreviated as AIGC) has made great progress, prompting the development of the Internet to enter a new stage of intelligence. Against this background, online public service advertising will inevitably be deeply affected by the development and changes of generative artificial intelligence. What insights people can gain from it has become an important issue worthy of attention at present.

CURRENT STATUS AND CHARACTERISTICS OF GENERATIVE ARTIFICIAL INTELLIGENCE AND ONLINE PUBLIC SERVICE ADVERTISING

Generative Artificial Intelligence

Since some references have been revised, the underlined sentence needs to be changed to: Generative artificial intelligence is a new technological means that generates content such as graphics, audio, and video codes based on rules such as algorithms and models. It is a revolutionary new technology.[2] This technology has received high praise for its performance in many traditional complex tasks such as context sensitive content generation.[3] Its difference from previous artificial intelligence is that it can generate new content based on big data on the Internet through machine learning, rather than simply relying on simple analysis and simple application of existing old things . Looking at the development history of generative artificial intelligence , it has roughly gone through three stages . The first stage is the early budding stage from the 1950s to the 1990s. The technology in this stage was just starting and the application scope was small . The second stage is the growth and development stage from the 1990s to 2022. During this stage , with the continuous improvement of technologies such as speech recognition, image recognition, machine translation, semantic analysis, and natural language processing, AI content generation technology has also made great progress. For example, in 2007, the first novel completed by an AI device, “1 The Road”, was published. In 2012, Microsoft demonstrated a fully automatic simultaneous interpretation system that can automatically translate English speech into Chinese speech . [4] Although some progress was made at this stage, the overall number of models remained limited, generalization capabilities were insufficient, and the generated content was homogeneous with constrained quality. The third stage spans from 2022 to the present. The year 2022 is regarded by the industry as the inaugural year of AIGC, during which large language models represented by ChatGPT, ERNIE Bot,

and SparkDesi continued to mature and were successively released. In this year, significant breakthroughs were achieved in technologies such as large-scale models and algorithms. Leveraging machine learning and training on massive datasets, the relevant models enabled high-quality cross-modal content generation and complex reasoning capabilities, thereby facilitating a transformative advancement in AIGC.

Currently, the development of generative artificial intelligence (AI) exhibits four main characteristics: First, powerful content generation capabilities. Current generative AI can produce multimodal content—including text, images, audio, video, and code—and assist humans in creating novel, original content rather than merely analyzing or classifying existing data. Its content generation capabilities have thus achieved a transition from "recognition" to "creation."Second,rapid technological iteration and updates. Taking "Jimeng AI," a platform familiar to advertising designers, as an example, its predecessor was Dreamina, which was internally tested in March 2024. Version 1.0 was released on multiple Android app stores, including Xiaomi, on July 31, 2024. Version 3.0 was launched in April 2025, but the multimodal large-model version, Jimeng AI-4.0, was quickly released on September 5th. This rapid transformation and release within just a few months demonstrates the speed of technological iteration in generative AI. Third, a very wide range of applications. Currently, generative AI has completed the construction of its foundational, technological, and application layers. Especially with breakthroughs in data, computing power, and algorithms, AIGC's commercial application functions are rapidly expanding, enabling the rapid generation of content within a short time frame, leading to its application across various fields such as journalism, advertising, painting, and design. Fourth, interactivity and steerability. Current generative AI primarily operates through human–computer interaction. Although there remains an issue of probabilistic output, humans can guide the outcomes of AIGC to meet expectations through methods such as model training, prompt engineering, and parameter control.

Online Public Service Advertisements

Online public service advertising is an important branch of online advertising. It is a special type of advertising that has developed and spread in the Internet environment. Therefore, it has the same characteristics as other types of advertising, but also has its own unique development characteristics.

First, content has become increasingly rich. The thematic content of online public service advertisements has undergone a marked shift from singularity to diversity. Early works primarily focused on traditional issues such as animal protection and environmental conservation. With societal development and media transformation, the range of themes has gradually expanded, bringing emerging issues such as mental health,

intergenerational communication, and cultural heritage into the public sphere, reflecting an astute response to contemporary social issues. This diversification of thematic content has not only expanded the scope of public service communication but also reshaped the cognitive frameworks and action logics through which the public engages with social issues, positioning online public service advertisements as important texts that reflect sociocultural transformation.

Secondly, the forms have become increasingly diverse. With the development and advancement of internet technology, the forms of online public service advertisements have become increasingly diversified, evolving from the initial flat and static formats to today's multi-dimensional and dynamic forms. Currently, online public service advertisements mainly fall into three categories: First, online flat public service advertisements, characterized by their static, two-dimensional form on the internet, commonly found in fixed locations on website pages; second, interactive online public service advertisements, which offer strong interaction with the audience. This is especially true as advanced technologies such as virtual reality, augmented reality, and motion capture have matured, making the interactive experience between the audience and the advertisement more immersive and enjoyable. For instance, the public service advertisement for Taishin Bank, created by Huang Youqiao, Chen Yuzhen, and their collaborators, employed augmented reality and facial tracking technologies to develop an exclusive Instagram filter game to promote the bank's public welfare voting campaign. Users could move their heads within the filter to draw hearts, with the virtual hearts converting into votes for the cause and dropping into a ballot box. Such engaging interactive design helped bridge the gap between the enterprise and the public; and third, online video public service advertisements, which disseminate public service advertisement content through video, mainly including film-based video public service advertisements and animated video public service advertisements. The former is primarily disseminated through television, film, and micro-films, employing either vivid storytelling or emotionally engaging presentations, resulting in strong audiovisual appeal. The latter is mainly presented through animation, with common dynamic forms including 2D animation, 3D animation, and frame-by-frame animation. These diverse forms of dynamic public service advertisements make them unique and captivating, attracting an increasing number of young people to appreciate and enjoy them. [5]

Third,the scope of dissemination has broadened. Another important feature of online public service advertisements is their strong ability to spread and their wide coverage. The reason for this is twofold. On the one hand, the content is easy to produce and can be updated quickly. This is because online public service adver-

tisements are mainly created by computer and do not need to be printed into physical objects. Therefore, they are easier to produce than public service advertisements in traditional media. Moreover, it is difficult to change public service advertisements in traditional media after they are published. Even if they can be changed, it usually requires a large price. Online public service advertisements can be changed and published anytime and anywhere, which facilitates the timely dissemination of the advertising content. On the other hand, the scope of dissemination is wide. This is because in today's "global village" social context, the dissemination space of online public service advertisements is very broad. They can be spread to all parts of the world through the Internet. At the same time, as long as you have Internet access, anyone in the world can view them anywhere. [6] Therefore, the dissemination of online public service advertisements has a strong coverage in both time and space, which is incomparable to public service advertisements in traditional media.

THE IMPACT OF GENERATIVE ARTIFICIAL INTELLIGENCE ON THE DESIGN OF ONLINE PUBLIC SERVICE ADVERTISEMENTS

Since 2022, the emergence of generative artificial intelligence, represented by ChatGPT, has quickly swept the global internet. The internet industry and ecosystem, including online public service advertising, are being continuously affected by it , with both positive and negative impacts.

Positive Impact

The positive impact of generative artificial intelligence on the development of online public service advertising is mainly reflected in three aspects:

On the one hand, generative artificial intelligence can become a new tool for creating online public service advertisements, thereby optimizing creative efficacy. Previously, the production of online public service advertisements mainly relied on tools such as drawing tools, design software, and computers. These tools required designers to operate them step-by-step to complete the advertisement. Generative artificial intelligence, however, is completely different. It can intelligently generate relevant advertisements without requiring step-by-step operation by the designer. It only needs to follow the designer's instructions to quickly generate new advertisements. The traditional advertising creation process may take hours, days, or even months, while using generative artificial intelligence can significantly reduce these time costs, thereby greatly improving the efficiency of online public service advertisement creation.

On the other hand, generative artificial intelligence (AI) can provide creative inspiration for designers of online public service advertisements. Generative AI can not only conduct preliminary design research and analysis

for designers, but also generate personalized recommendations of advertising artworks based on their needs , thus providing design references for online public service advertisement designers . Taking Baidu's "Wenxin Yiyan" AI model as an example, designers can click on Wenxin Yiyan's AI drawing function, write their ideas into its dialog box, and generate an advertising illustration in about ten seconds. This illustration visualizes the designer's ideas and provides a design direction. Moreover, generative AI can complete preliminary design research, market analysis, and artwork recommendations within minutes, so designers can utilize generative AI to provide creative inspiration whenever needed.

On another front, generative artificial intelligence (AI) can enrich the artistic forms of online public service advertisements. This is because generative AI not only possesses strong imitation capabilities but also good innovation capabilities. Designers of online public service advertisements can use generative AI to both imitate and generate high-quality public service advertisements and to create their own innovative works. Moreover, generative AI can continuously optimize its generation capabilities by learning from and imitating a large number of advertising artworks, thereby producing even more outstanding and high-quality works , which provides endless possibilities for the creation of online public service advertisements . For example, designers can use generative AI to combine, redesign, and optimize public service advertisements of different styles, forms, and techniques, thereby creating more diverse online public service advertisements. Therefore, the introduction of generative AI technology can enrich the artistic forms of online public service advertisements and provide audiences with a rich and diverse artistic experience.

Negative Impacts

"Technology is a powerful tool for development, but it can also be a source of risk." [7] Generative artificial intelligence is like a double-edged sword. While it has a positive impact on the development of online public service advertising, it has also generated certain negative impacts. Specifically, there are two main negative impacts: one is the issue of intellectual property rights. The reason is that generative artificial intelligence requires a large amount of training data, which usually includes various types of text data such as advertising text, product descriptions, user reviews, news articles, and social media posts. [8] These data are obtained by artificial intelligence systems through the network. Many of these text data are obtained without the consent of the original copyright holders, which means that the works created by generative artificial intelligence still retain the characteristics of the original text data, thus generating intellectual property disputes about the works generated by generative artificial intelligence. For example, at the end of January 2023, Getty Images

sued Stability AI in the High Court of London for illegally copying and processing millions of copyrighted images by Stability AI's training model, Stable Difussion. [9] This is the world's first AIGC infringement case, which has sparked controversy and concern among many people about the copyright infringement risks of AIGC generated content.

Second, there is the issue of value guidance. This issue primarily refers to phenomena that may arise when people use generative artificial intelligence. First, the generative function of generative AI is mainly realized through human-computer interaction. In the design of online public service advertisements, humans remain the dominant force; the designer's creative thinking, knowledge background, and value orientation fundamentally influence their design work. If a creator operates from a flawed value orientation or incorrect design objectives and then uses AIGC to assist in generating the relevant advertisement, the value orientation of such work will be problematic—this is the root cause of the value orientation issue. Second, if a designer uses an AIGC model with limited overall capability, this issue may also arise. The reason lies in the diversity of AIGC models: different models have different functionalities and vary in the accuracy of content generation. A model's performance in terms of accuracy depends on a comprehensive balance of capabilities such as data mining, algorithmic reasoning, instruction following, and uncertainty avoidance. AIGC models with stronger overall capabilities tend to produce more accurate results, whereas those with weaker capabilities yield less accurate ones. Third, if a designer is not proficient in operating the AIGC model, this issue may also arise, which depends on the designer's level of familiarity with the AIGC model and their mastery of the practical techniques of human-computer interaction. Therefore, the designer's values play a crucial role in the process of using AIGC for online public service advertisement design, while the designer's choice and operation of the AIGC model also have a certain impact.

COPING STRATEGIES FOR ONLINE PUBLIC SERVICE ADVERTISEMENT DESIGN UNDER THE INFLUENCE OF AIGC

Actively Face and Embrace the AIGC Era

And this trend will intensify. People need to actively face and embrace it. Tencent released an AIGC development trend report on January 31 , stating that AIGC represents the leap of AI technology from perceiving and understanding the world to generating and creating the world , and is driving artificial intelligence to usher in the next era. [10] Faced with this wave of the times, based on different positions, some people hold a cautious wait-and-see attitude, while others hold a positive attitude. For the online public service advertising industry and related creators, the latter perspective should be adopted, and the new wave led by generative artificial

intelligence should be embraced proactively. The reason is that this groundbreaking innovative technology of generative artificial intelligence is constantly impacting all areas of the advertising industry, and online public service advertising is no exception. Generative artificial intelligence will become a new technology collection for generating online public service advertising and can inspire online public service advertising to become a new advertising paradigm of intelligent advertising content creative production and human-computer interaction. Therefore, the online public service advertising industry and creators should keep pace with the times and pay close attention to and understand the development and changes of generative artificial intelligence in order to continuously promote the sustainable development of online public service advertising in the new era.

Enhancing the Core Competitiveness of Advertising Designers

Generative artificial intelligence, while capable of overcoming the limitations faced by online public service advertisements in the traditional advertising era, can efficiently accomplish design research through machine learning, as well as complex tasks such as market analysis that previously required team-based efforts. It can also rapidly generate advertising design solutions for creators within a short period of time. However, current artificial intelligence technology still has certain weaknesses, such as data defects and a lack of empathy. [11] It does not fully possess human capabilities for reasoning, innovation, or perception. Moreover, the current method of operation for generative artificial intelligence still primarily relies on users inputting specific instructions to generate content. Therefore, generative artificial intelligence can become a human auxiliary tool, but it cannot replace humans in completing all work. Online public service dvertising designers should pay more attention to the cultivation of their own qualities and abilities in all aspects, including continuously expanding the relevant knowledge reserves of online public service advertising, improving the level of advertising design knowledge and skills, improving their own design aesthetics, and enhancing design thinking and innovative expression. These are human creativity that AIGC cannot replace. Only by valuing and strengthening these qualities can we fundamentally determine whether designers can create truly high-quality online public service advertising works.

Make Reasonable Use of AIGC as a Productivity Tool

Generative artificial intelligence plays a vital role in developing productivity.[12] Generative artificial intelligence is trained by machine learning and obtains knowledge and creative models in the field of advertising from a large number of copywriting, print and film and television advertising samples in data and corpus. It

can create a large number of advertising content to choose from in a few seconds. [13] This technical feature enables the rapid, batch generation of diverse advertising texts, images, illustrations, and even complex dynamic video content in a short period of time, providing strong support for the creative production of online public service advertisements.

However, viewing AIGC merely as a highly efficient tool may underestimate the paradigm shift it brings to creation. More accurately, AIGC should be considered a "digital creative collaborator." Its value lies not only in replacing repetitive labor but also in expanding the boundaries of creative possibilities. For creators of online public service advertisements, the key challenge is how to achieve a human-machine collaborative creative workflow. First, it is necessary to select an appropriate AIGC tool based on the requirements of the creative task. For example, creative thinking for advertising copy can be assisted by large language models, while the design of advertising images can utilize image generation large model tools. Therefore, when choosing an AIGC tool, it is important to compare multiple options and select one with strong overall capabilities. Second, pre-defined tasks and model adjustments are necessary. Before generation, creators should provide precise instructions to the AIGC tool based on a clear public service theme, target audience, and value proposition. This includes setting style keywords, emotional tone, and cultural symbol constraints, additionally, the generation effect of the AIGC model can be adjusted through model training, parameter control, and other means, thereby transforming large-scale random generation into purposeful, targeted creation. Third, Generative artificial intelligence tools serve as a source of inspiration [14], and the output of AIGC should be positioned as an initial draft of creative ideas. Excellent creators can leverage its rapidly generated diverse solutions to spark new associations, break through established mindsets, or discover unexpected visual combinations and narrative angles. However, it is crucial to note that directly equating AIGC output with the final product can easily lead to over-reliance on AIGC and the development of intellectual inertia. This can also result in superficial works lacking profound emotional insight and social reflection, ultimately leading to homogenization and a shallow understanding of the meaning of public service advertisements. Therefore, a reasonable application of this model requires creators to maintain a critical and dominant position, combining the technical characteristics of AIGC with their own individual thinking, and upholding creative subjectivity and intellectual depth while leveraging technology.

Formulate Industry Standards to Strengthen Value Guidance

In the face of potential intellectual property disputes and value orientation risks brought about by generative artificial intelligence, the online public service advertising industry and designers need to pay attention and take appropriate measures to address them.

At the industry level, a strategy combining proactive guidance and regulatory constraints should be adopted. On the one hand, industry associations or authoritative institutions can take the lead in formulating "Ethical Guidelines Related to AIGC-Assisted Public Service Advertising Creation," clarifying the legality of training data sources during the creation process, copyright statement rules for generated content, and principles for defining the contributions of humans and AI. On the other hand, benchmarks can be set by innovating industry activities, such as holding public service advertising competitions with the theme of "AI and Humanistic Care," clearly defining veto criteria for technology abuse and value bias, thereby guiding positive creation in practice. In addition, it is urgent to establish a content review enhancement mechanism adapted to the AIGC era. On the basis of traditional manual review, explainable AI detection tools should be introduced to conduct value alignment analysis and fact-checking of generated content, forming a closed loop of technology governance.

For individual designers, responsibility evolves into a multifaceted requirement. This involves not only learning and using new technologies but also cultivating a responsible creative mindset. Designers need to proactively update their knowledge structure, understand industry standards, enhance their knowledge of public welfare and cultural literacy, and continuously improve their design skills and their ability to apply AIGC. At the legal level, they need to understand the copyright and portrait rights risks that generated content may involve. At the ethical level, they need to deeply reflect on the unique nature of public service advertising as a vehicle for disseminating social values. The core of public service advertising lies in touching hearts and promoting positive social change, which requires creators to internalize correct values as a pre-processing filter for their work. Only when designers possess a deep sense of social responsibility, humanistic concern, and value judgment can they ensure that the works generated by this powerful tool, AIGC, ultimately serve the original intention of public welfare, conveying sincere, profound, and constructive social messages, rather than technological displays or empty forms. Therefore, relevant practitioners need to establish correct values to ensure that online public service advertising works meet the development requirements of the new era.

CONCLUSION

Generative Artificial Intelligence (AIGC), a groundbreaking innovative technology, is continuously impacting all sectors of the social economy. With the development and progress of generative AI, the future development of online public service advertising is bound to undergo profound changes. Although the introduction of generative AI into online public service advertising may generate some intellectual property disputes and value guidance issues, its overall impact is more positive. Generative AI can not only become an efficient tool for creating online public service advertisements, providing designers with creative inspiration, but also enrich the artistic form and user experience of online public service advertisements. Chinese President Xi Jinping has emphasized: "We must cultivate a cultural concept of 'technology for good,' so that technology can better enhance human well-being." The intervention of generative AI in the development of online public service advertising can clearly become a new paradigm for technology for good, enabling technology to enhance human well-being. Faced with the new wave and new look of generative AI, the online public service advertising industry and related practitioners should actively embrace and correctly understand AIGC, while striving to improve their core competitiveness and establish correct values to rationally utilize AIGC. This will allow them to transform generative AI into a helpful tool in the right direction, thereby facilitating the design and creation of more excellent online public service advertisements and contributing to the construction of spiritual civilization and human well-being in the new era.

Author Contributions

Jinfu Liu: Conceptualization; Methodology; Project administration; Software; Resources; Formal analysis; Writing - original draft; Writing - review & editing.

Conflicts of Interest

The author declares no conflict of interest.

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Data Sharing Agreement

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