

A Systematic Review of Public Relations Research in the Context of Artificial Intelligence

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Abstract: In the context of the rapid development of artificial intelligence technology, this article provides a systematic review of public relations research in the context of artificial intelligence to provide valuable references for future public relations research and practice. Collect literature data from CNKI, use systematic review methods to select literature that meets the standards, and sort and summarize it from four dimensions: application background, application scenarios, challenges faced, and response measures. Research has found that currently, applying artificial intelligence technology to public relations practice has become a basic consensus in academia; The paradigm of public relations research in the era of artificial intelligence has changed; In the short term, artificial intelligence technology will not completely replace public relations personnel; The measures for responding to public relations in the era of artificial intelligence can be summarized and divided into two levels: theoretical and practical. In the future, it is necessary to further explore and improve public relations theories related to artificial intelligence, construct new analytical frameworks and research methods to adapt to the changes brought about by technology.

Keywords: Public relations, Digital public relations, Artificial intelligence, Intelligent technology, Product marketing.

1. Introduction

The development of public relations practice is closely related to technology. After the rapid development of intelligent technology, the emergence and application of ChatGPT[1]and Sora [2]released by Open Artificial Intelligence in 2022, as well as a series of artificial intelligence technologies, have attracted the attention of public relations practitioners and scholars. Academic circles and industry associations have also held large-scale conferences recently to explore the impact of artificial intelligence technology on public relations. For example, the 2023 China Public Relations Development Conference was held in Beijing, focusing on the theme of "high-quality development of public relations services" [3]. The first China Public Relations Lecture hosted by the China Public Relations Association was also held in Beijing, delving into the new changes that artificial intelligence brings to the field of public relations and grasping the new trends in the development of the public relations industry[4].

Recent research indicates that an increasing number of public relations practitioners are adopting artificial intelligence technologies such as intelligent robots, Chatgpt, and Sora as tools for communicating with stakeholders. Empirical research data also indicates that intelligent technology

not only provides additional channels for public relations practitioners to convey information to stakeholders[5], but also liberates labor resources, allowing public relations professionals to focus more on other creative work[6].

The emergence of new forms of artificial intelligence technology has also prompted scholars to re-examine the theorization of artificial intelligence technology and its impact on public relations practice. In this emerging field, several key features of artificial intelligence technology seem to have been identified: interactivity[7][8], Personalization[9], Disruption [10]. Due to these unique features and the recent widespread application of artificial intelligence technology in the field of public relations, it is necessary to ask: Is the impact of artificial intelligence technology applications sufficient to make public relations in artificial intelligence a subfield of traditional public relations research? Are the research questions raised for public relations in artificial intelligence the same as those raised for traditional public relations? More fundamentally, has artificial intelligence technology changed the paradigm of public relations research?

At present, the research perspectives on public relations in the era of artificial intelligence in China are diverse, hierarchical, and conceptually intertwined. Few scholars have conducted systematic literature reviews from the overall perspective of public relations in the era of artificial intelligence. Therefore, in order to address the above issues, this study analyzed relevant articles published from 2013 to 2024 and used a systematic review method to sort and summarize them from four dimensions: application background, application field, challenges faced, and measures taken to address them.

2. Literature Review

Artificial intelligence, as a comprehensive discipline that studies machine intelligence and intelligent machines, involves disciplines such as information science, psychology, cognitive science, thinking science, systems science, and biological science. Currently, it has achieved practical results in multiple fields such as knowledge processing, pattern recognition, machine learning, natural language processing, game theory, automatic theorem proving, automatic programming, expert systems, knowledge bases, and intelligent robots. However, there is no widely recognized unified definition of artificial intelligence. Professor Winston from MIT in the United States believes that "artificial intelligence is the study of how to make computers do intelligent work that only humans could do in the past." Professor Nilson from Stanford University in the United States believes that "artificial intelligence is a discipline about knowledge, how to represent knowledge, acquire knowledge, and use knowledge" [11].

The development and application of artificial intelligence have gradually shown that it will affect and change human society in many aspects, profoundly impacting people's lives. Especially with the gradual improvement of data science, artificial intelligence as a technological support will better solve complex problems. At the same time, this also requires the public relations industry to constantly adapt and respond to new technological changes in order to maintain effective communication and interaction.

RQ1 Is the impact of artificial intelligence technology application sufficient to make public relations in artificial intelligence a subfield of traditional public relations research?

H1 The application of artificial intelligence technology in public relations practice has become a basic consensus in academia.

Pavlik explored the application of different artificial intelligence technologies in monitoring news media[5]; Li Jian believes that artificial intelligence is to marketing what autonomous driving is to cars. While its flaws can be questioned, its arrival cannot be stopped[12]; Yaxley proposed that strategic artificial intelligence can be used as a tool to liberate labor resources, allowing practitioners to focus on other more important tasks[6]; Wen Qian believes that the impact of artificial intelligence

on industries such as marketing is also disruptive, and business expansion not only needs to be more diversified, but also the product evaluation system needs to be rebuilt[13].

RQ2 Artificial intelligence technology changed the paradigm of public relations research?

H2 The artificial intelligence technology has brought new opportunities to public relations practice, and the research paradigm of public relations in the era of artificial intelligence has changed.

Zhang Min believes that artificial intelligence in the context of public relations can be defined as the human cognitive technology or human cognitive function independently or together with public relations practitioners in carrying out public relations activities[14]. It should be noted that artificial intelligence in public relations is a comprehensive intelligence that can integrate comprehensive information that humans cannot fully grasp. This efficient coordination will play an important role in public relations.

RQ3 What challenges does artificial intelligence technology bring to public relations practice?

H3.1 The challenges faced by public relations in the era of artificial intelligence can be summarized into two aspects: skill challenges in the workplace and anxiety about AI replacing the basic work of public relations personnel.

H3.2 Artificial intelligence technology will not replace public relations personnel in the short term.

RQ4 Public relations industry respond to the challenges brought by artificial intelligence technology to public relations practices?

H4 The measures for public relations response in the era of artificial intelligence can be summarized and divided into two levels: theory and practice.

3. Research Design

3.1. Research Methods

This article adopts a combination of bibliometric and systematic review methods for research. Using bibliometric methods to understand the macro situation of public relations research in the context of artificial intelligence, and using systematic review methods to analyze the main research problems in this field.

3.2. Literature collection

Based on the above literature review results and combined with preliminary searches, it is found that public relations in the era of artificial intelligence includes many aspects and requires the use of multiple keywords to ensure recall. Using CNKI as the data source, the literature type is journal. The search equation is: search equation=(artificial intelligence+AI) * (public relations+PR+marketing+brand+relationship management). The search was conducted on June 30, 2024, and a preliminary search yielded 342 data points. After removing duplicates, the number of literature excluded based on titles and abstracts was 219.

3.3. Literature screening and its process

The inclusion criteria for bibliometric and systematic review methods are not consistent. The standard of bibliometric method is relatively loose, and literature can be used as a measurement object as long as it is related to the research topic; The systematic review method has strict inclusion criteria, and the literature must be closely related to the research topic, with a certain guarantee of literature quality[15]. Therefore, bibliometric analysis can be directly conducted on the 219 literature mentioned above, while the literature included in the systematic review still needs precision control. The screening criteria are shown in Table 1, and the screening process is illustrated in Figure 1.

Table 1: Inclusion Criteria for Literature in Systematic Review Analysis

Inclusion criteria	Exclusion criteria	Exclusion criteria
Literature types	journals, dissertations	non journals, dissertations: such as information, books, patents, etc
Research type	original paper	non original paper: such as review articles, policy interpretation articles, etc
Research object	public relations and marketing, brand image, etc.	in the context of artificial intelligence, which are not consistent with the research topic, such as maintaining interpersonal relationships

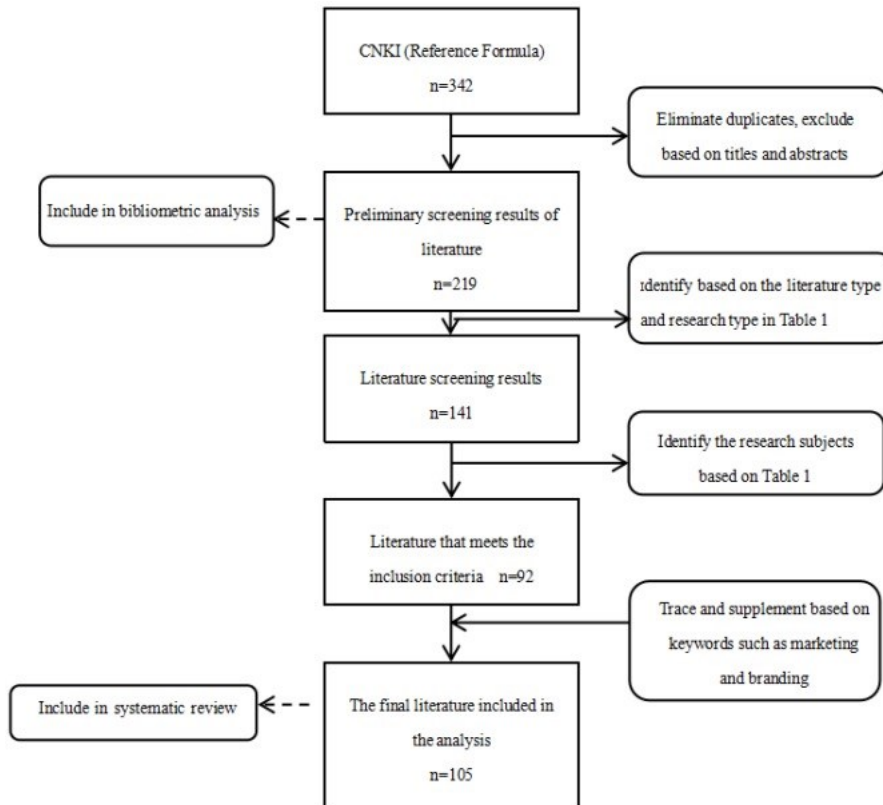


Figure 1: Systematic Review Literature Selection Process

4. Research results

Deep learning is regarded as a core technology in artificial intelligence and a new wave of artificial intelligence. 2013 is widely regarded as the "mature year" of deep learning [16]. By reviewing the literature from 2013 to June 30, 2024 that was included in the systematic analysis, it was found that the number of research papers on public relations in the era of artificial intelligence has been roughly increasing year by year. It can be seen that with the development of artificial intelligence technology, various types of artificial intelligence technologies have been widely applied in the field of public relations. This article will provide a systematic review from four aspects: the application background of artificial intelligence in public relations, the application scenarios of artificial intelligence in public relations, the challenges faced by public relations practice under the application of artificial intelligence, and the measures taken to respond to public relations practice under the application of artificial intelligence.

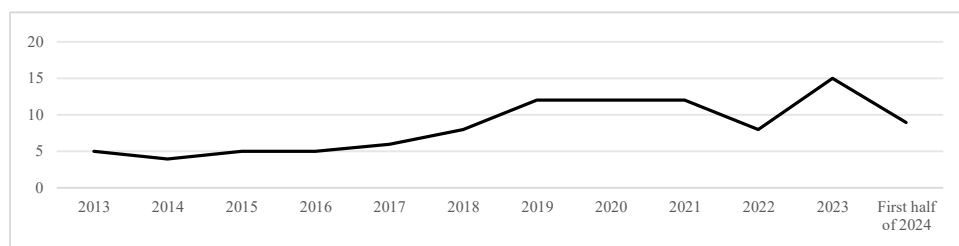


Figure 2: Trends in publications from 2013 to the first half of 2024

4.1. The Application Background of Artificial Intelligence in Public Relations

At the 2023 Academic Annual Conference held by the China International Public Relations Association, Professor Guo Huimin, Vice President of CIPRA, pointed out that in the future, "international communication" and "artificial intelligence" are worth paying attention to in Chinese and international public relations [17].

The rapid development of artificial intelligence will have a significant impact on the existing global communication power structure. In the era of globalization of information networks and media, communication power has become a competitive and game factor that government decision-makers around the world must consider due to its impact on social public opinion, public perception, foreign policy, and other aspects. Artificial intelligence will strengthen or weaken existing communication power structure units from multiple levels, which will also have an impact on public relations practices[18][19][14][20][21].

Artificial intelligence technology has brought new opportunities to public relations practice. For example, Chat GPT is rational, well intentioned, able to respond quickly, and has a bit of humor, which can be regarded as a communication master. And communication is an important part of public relations. Yang Yang pointed out in his article through empirical research that some people say that 80% of work problems are communication problems, and 80% of unhappiness in life is affected by communication. He believes that Chat GPT, as a communication master, is very meaningful for the public relations industry[1].

In the era of artificial intelligence, the paradigm of public relations research has changed. Traditional public relations (PR) theory and paradigm have experienced two major impacts from technology: the first is the Internet and big data. Experts believe that the development of digital public relations can be traced back to the 1970s, when the use of electronic bulletin boards and news distribution became popular. The second one is digitalization and artificial intelligence. The impact of big data on traditional public relations has become apparent, while the influence of artificial intelligence is gradually emerging. These two significant impacts have reshaped the ways in which public relations professionals interact with communication audiences, create narratives, and analyze data [22].

4.2. Application scenarios of artificial intelligence in public relations

Public relations communication has four characteristics, namely proactivity, openness, clarity, and purposefulness [21]. Applying artificial intelligence technology to specific practices in public relations, combined with the four characteristics of public relations communication, has formed different application scenarios.

Albert Einstein once said: Computers have incredible processing speed and accuracy, but they lack 'intelligence'. People have no advantage in speed and often make mistakes, but their wisdom is outstanding [20]. In current public relations practice, artificial intelligence mainly assists traditional PR fields such as writing, social media publishing, content analysis, media monitoring, and news

keyword exposure, which can help PR practitioners improve work efficiency. On February 15, 2024, Open Artificial Intelligence officially released Sora, which can convert text into short videos up to one minute in length. Sora's application will help improve the production efficiency of short video production, make short video narratives more eye-catching, enrich and personalize strategic communication scenarios, and have a significant impact on enhancing the cognition, attitude, and behavior of strategic communication [2].

In terms of data analysis and content generation, the main areas of influence are currently focused on big data analysis and content generation (images, animations, videos), which can also play a certain role in conceptualizing, strategizing, writing, and editing for public relations professionals. At present, public relations (PR) is no longer just about dealing with "ink", because regardless of whether one is willing to accept it or not, in fact, digital technologies such as information communication and its processing have penetrated and entered the content production, arrangement, and publishing channels of traditional PR fields [22][23][24]. By utilizing artificial intelligence (AI) and machine learning, it aims to increase the conversion rate of test drives to digital audiences. Using first-hand data to gain insights into the audience's real experiences [22].

In terms of public opinion communication, based on the symptoms of public opinion communication problems caused by the latest Internet technology, some scholars proposed to establish the "big data view" and "public relations view" of public opinion communication using interdisciplinary thinking [25]. Scholars have also combined artificial intelligence with government public relations, proposing to establish "government artificial intelligence government" communication models, "government artificial intelligence public" communication models, and "artificial intelligence government artificial intelligence" communication models [26], providing new ideas for countries to formulate technology governance policies based on their own situations.

In addition, artificial intelligence technology can help countries better communicate and dialogue strategically, promote international cooperation, and enhance their ability to address challenges such as climate change and global public health through sharing data and algorithms. Global communication also helps to create a better international economic environment, improve production efficiency, promote resource conservation and energy transformation. The key is for all countries to jointly face the challenges and risks brought by artificial intelligence technology, ensure technological security and sustainable development, and promote global fairness and justice in information dissemination on this basis[18].

4.3. Challenges faced by public relations practice under the application of artificial intelligence

The rise of artificial intelligence has not only raised concerns about potential unemployment, but also raised fears about moral issues [27]. According to a survey, 25% of public relations workers in the UK stated in interviews that they need more education and training on artificial intelligence technology, and approximately 63% of industry professionals find it difficult to distinguish between real information and fake news [28]. Chatbots, fake news, hate speech, and other ethical issues on social media have become important concerns for public relations clients. In higher demand strategic consulting, emerging artificial intelligence technologies have also raised concerns for some people, as AI technology has unparalleled advantages in collecting and analyzing data, which may replace human labor [14].

Artificial intelligence has also brought certain negative impacts to the public relations industry. The popularization and application of artificial intelligence technologies such as Chat GPT have greatly improved the efficiency of the public relations industry [29]. However, due to the universality of these artificial intelligence, they have shortcomings such as insufficient relevance to specific products and services, production of homogeneous content, weak creativity, and low quality of

generated products [22]. Various types of generative artificial intelligence can also easily lead to a more complex crisis management environment for public relations entities, with text and video materials containing false information that may be more difficult to distinguish, weakening the initiative of creators towards creativity, and increasing pressure and industry impact on the efficiency upgrade of the media industry's production business [2].

However, there are still limitations to using artificial intelligence for public relations, as the suggestions and ideas it provides are not interpretable. Artificial intelligence cannot replace the work of public relations personnel, especially in communicating emotional attributes between people. Therefore, the public relations profession still has growth momentum and will not cause a large number of professional talents to lose their jobs due to artificial intelligence [29][30]. Artificial intelligence will not replace public relations personnel in the short term, and it will indeed bring some help. Yang Yang suggests that public relations workers still need to prove their value, that is, to be a "human" - human thinking, subjective judgment, and other experiential things. There are definitely many advantages over artificial intelligence in many aspects[1].

4.4. Measures to address public relations practices under the application of artificial intelligence

At present, the ideas of artificial intelligence products and business models mainly focus on the powerful impact generated by visualization, narrative, and image-based narrative, which is partly attributed to their ability to trigger emotions and heuristic information processing. The problem that artificial intelligence technology needs to face and solve when entering the field of public relations is how to increase the evidence that visualization and narrative can have a greater impact on target audience persuasion and decision-making than before [31].

From a theoretical perspective, public relations practices in the era of artificial intelligence still need to focus on the public perspective and make facing the public their 'core competency'. The concept of 'core competence' was originally a theory of enterprise management. In 1990, Prahalad and Gary Hamel first proposed the concept of "core competencies" in the Harvard Business Review. The beginning refers to the company's main capability, which is the ability to continuously develop and maintain a competitive advantage in the competition; At the same time, it is a capability that is difficult for competitors to replicate and has irreplaceability. Whether it is the public relations model composed of "organization public communication" or the four communication modes summarized by Professor Grunig (news agency mode, public information mode, two-way imbalance mode, and two-way balance mode), they clearly demonstrate the effectiveness of public relations communication in different scenarios. The theory of "bidirectional symmetrical information dissemination with reputation as the core" has preserved one party's territory for public relations, and in the era of artificial intelligence, it still needs to face the public to ensure the effectiveness of public relations dissemination in the AI era [32]. In the stage of brand value differentiation brought by artificial intelligence, the focus is on creating value for users by embracing and getting close to them, and empowering them with artificial intelligence technology [19].

From a practical perspective, firstly, it is important to finely divide the audience. Expand the sources of communication data collection, improve the precision of data analysis, segment audience needs, cognitive landscapes, and behavioral preferences, identify enemies and friends, and provide a foundation for coordinated decision-making through different means such as "attack and defense" and "struggle and harmony" [26][33]. Secondly, targeted 'curation'. Focusing on algorithms and key social platforms, with the audience as the communication point, establish a sound digital government communication human-machine collaboration model, promote the comprehensive integration of UGC, OGC, PGC, and AIGC, and generate personalized and differentiated communication content. By utilizing algorithms to achieve dynamic matching between users and information, strategic

algorithms such as feeding, layer feeding, and cocoon weaving are used to establish or strengthen spatiotemporal connections between users [26][34]. Once again, integrate and disseminate. Skilled in integrating digital government communication elements such as different entities, regions, platforms, tools, and forms to form strategic integrated communication plans, allowing multiple voices and different entities to achieve maximum communication effects through interweaving and influencing each other, thereby achieving resonance of "point, line, and surface" global digital government communication on the same frequency [26].

In addition to establishing effective crisis management mechanisms for public relations entities, government departments and industry associations need to address issues such as authenticity, piracy, infringement, and potential abuse by establishing and improving laws, regulations, departmental rules, and industry ethical norms, as well as improving public media literacy [2]. In this process, the public relations industry should also do a good job in talent cultivation and strengthen communication and exchange with government departments [35].

5. Conclusion and Discussion

5.1. Research Conclusion

Firstly, applying artificial intelligence technology to public relations practice has become a fundamental consensus in academia. With the rapid development of artificial intelligence technology, more and more scholars and practitioners realize that artificial intelligence can not only improve the efficiency and effectiveness of public relations work, but also open up new practical fields. Whether it's media monitoring, public opinion analysis, or social media management, artificial intelligence technology has shown great potential. It can not only process massive amounts of data, but also extract valuable information from it through deep learning algorithms, providing scientific basis for public relations decision-making.

Secondly, artificial intelligence technology has brought new opportunities to public relations practice, and the paradigm of public relations research in the era of artificial intelligence has changed. In traditional public relations practices, many tasks rely heavily on manpower and time, and the application of artificial intelligence has changed this situation. Through automated tools and intelligent systems, public relations personnel can conduct crisis management, brand communication, and audience analysis more efficiently. At the same time, the continuous advancement of artificial intelligence technology has also promoted the development of public relations theory, with new theories and methods emerging one after another, injecting new vitality into public relations research.

Thirdly, the challenges faced by public relations in the era of artificial intelligence can be summarized into two aspects: skill challenges in the workplace and anxiety about AI replacing the basic work of public relations personnel. Although artificial intelligence technology has brought many conveniences, it also puts higher demands on the skills of practitioners. Public relations personnel need to master new technologies and tools, understand the operating principles of artificial intelligence, in order to better utilize its advantages. In addition, with the deepening application of artificial intelligence in the field of public relations, some basic jobs may be replaced, which has triggered anxiety about unemployment within the industry. However, in the short term, artificial intelligence technology will not completely replace public relations personnel, as many complex strategic decisions and creative work still require human intelligence and experience.

Fourthly, the measures for public relations in the era of artificial intelligence can be summarized and divided into two levels: theoretical and practical. At the theoretical level, scholars need to further explore and improve public relations theories related to artificial intelligence, construct new analytical frameworks and research methods to adapt to the changes brought about by technology. At the practical level, public relations practitioners need to constantly learn and update their skills, actively

embrace technological changes, and enhance their competitiveness. At the same time, enterprises and organizations should invest in employee training and technology development, establish a sound technical support system, and ensure that public relations work can achieve more efficient and accurate goals with the help of artificial intelligence technology. Through the dual efforts of theory and practice, the field of public relations can better meet the challenges and opportunities of the era of artificial intelligence.

5.2. Research prospects

Overall, artificial intelligence has brought unprecedented opportunities and challenges to public relations. By actively responding to these changes, the field of public relations will be able to embrace broader development prospects in the new technological context, achieving more efficient, precise, and personalized public relations practices.

In the future, artificial intelligence will continue to drive changes in the field of public relations. The research on public relations will be further deepened, with a systematic theoretical study of the application of artificial intelligence technology, and the construction of new analytical frameworks and practical models. At the same time, public relations education also needs to keep up with the pace of technological development and cultivate versatile talents who can adapt to future needs. Enterprises and organizations should actively invest in technological innovation and talent cultivation, and establish a sound technical support system. To promote the rational application of artificial intelligence technology in the global public relations field, it is necessary to choose a win-win situation for the future of humanity rather than a zero sum game, and move towards a coordinated governance mechanism and artificial intelligence development path that can bring common benefits to the international community[18].

Although this study reveals a shift in public relations research in the era of artificial intelligence, some limitations should be noted. As the purpose of this study is to analyze the research agenda and related findings in this field, it relies solely on the conclusions and findings of previous studies included in CNKI articles and has been screened according to standards. However, these standards do not guarantee that the evaluation of each article is effective, and this limited selection criterion imposes limitations on the description of the field presented in this article. In future research, the number of samples selected should be expanded.

This study provides a certain and relatively systematic insight into the current status of public relations research in the era of artificial intelligence, but the following improvements can and should be made. Firstly, in order to better understand the characteristics of artificial intelligence technology and its impact on public relations practice, interdisciplinary research such as computer science, mathematics, etc. can be conducted in future public relations research. Secondly, future research can still develop more dynamic methods, such as longitudinal studies and surveys, to explore the application and development of artificial intelligence technology in the field of public relations within a certain period of time. In addition, research methods can be more diversified while enhancing cultural sensitivity and symmetry in the study.

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