

Digital Public Relations: Literature Review on Adaptation of Communication Strategy in the Industrial Era 4.0

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ABSTRACT

The development of digital technology in the Industry 4.0 era has brought significant changes to public relations (PR) practices. This study aims to systematically review the literature that discusses how communication strategies in PR practices adapt to digital transformation. Using the literature study method, this study examines various relevant scientific sources, both in the form of academic journals, books, and research reports from 2014 to 2024. The main focus includes the use of digital technologies such as social media, big data, artificial intelligence, and automation in organizational communication processes. The results of the study indicate that the digitalization of PR practitioner training not only masters traditional communication skills, but also digital competencies such as digital content management, social media analysis, and the use of data in decision-making strategies. This study also identifies key challenges in the transition to digital PR, including ethical issues, data security, and the need for high digital literacy. This study contributes to the academic and practical understanding of the evolution of PR communication strategies in the context of the industrial revolution 4.0.

Keywords: Digital Public Relations, Communication Strategy, Industry 4.0, Literature Review, Digital Transformation.

1. INTRODUCTION

The Industrial Era 4.0 has brought fundamental changes in the way organizations operate, including in terms of communication strategy. Digital transformation has become a key pillar in this phase of the industrial revolution, which is marked by the use of advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), big data, and cloud computing. These developments have created a new landscape in organizational communication, where interactions are no longer one-way, but rather interactive, real-time, and data-based. The World Economic Forum (2023) reports that more than 90% of organizations globally are undertaking digital transformation initiatives to improve operational efficiency and resilience, including in corporate communication and public relations practices.

In the context of public relations, digital transformation has shifted the communication paradigm from a conventional model to a more participatory and responsive digital approach. Organizations are not only delivering messages through traditional media, but are now also optimizing various digital platforms such as social media, blogs, interactive websites, and utilizing artificial intelligence and data analytics to understand audience preferences.

Specifically in Indonesia, digital transformation has also shown significant developments. Data from the Ministry of Communication and Information of the Republic of Indonesia (Kominfo, 2024) revealed that around 82% of public and private organizations have

adopted digital communication strategies in their operational activities. In addition, the We Are Social and Meltwater (2024) report states that 74% of internet users in Indonesia actively interact with brands through social media, indicating that digital channels have become the main space in building relationships between organizations and the public.

The emergence of digital technology has changed the pattern of organizational communication from being one-way and centralized to being more open, participatory, and data-based. This change marks a paradigm shift in public relations practices, where organizations must now build dynamic and ongoing dialogue with their publics. Not only as a messenger, organizations are required to be adaptive communication partners, listen to the public's voice, and respond to issues quickly and appropriately through various digital channels (Ministry of Communication and Information of the Republic of Indonesia, 2024).

In this context, digital public relations (DPR) becomes an essential strategy to address communication challenges in the digital era. DPR practices enable organizations to use digital-based communication technology to build, maintain, and strengthen relationships with stakeholders more effectively. McKinsey & Company (2023) shows that organizations that implement digital-based communication strategies experience a 30–40% increase in public interaction, with higher message effectiveness compared to traditional approaches. This is supported by the ability of technology to customize messages personally, measure public response in real-time, and manage reputation through an integrated digital media monitoring system.

This transformation of communication patterns is also evident in Indonesia. Based on the Digital 2024: Indonesia report by We Are Social and Meltwater, it was noted that 74% of internet users in Indonesia actively interact with brands through social media, and 66% seek information about organizations or services through digital channels first before deciding to engage further (We Are Social & Meltwater, 2024). Meanwhile, the Ministry of Communication and Informatics of the Republic of Indonesia (2024) reported that 82% of public and private organizations have shifted most of their communication activities to digital platforms as part of institutional transformation efforts (World Economic Forum, 2023). This fact shows that the communication patterns that are now being built are no longer linear or top-down, but rather horizontal and dialogical, which requires organizations to review their communication strategies as a whole.

With this background, it is important to conduct a comprehensive literature review to evaluate the extent to which organizations have adapted their communication strategies in response to changing patterns of communication with the public in the Industry 4.0 era. This study is crucial to understanding the new dynamics in digital public relations practices, as well as offering a conceptual mapping that can be the basis for developing more relevant and contextual communication strategies in the future.

The development of digital technology in the Industry 4.0 era has created a very different communication landscape from the previous decade. The emergence of social media, search algorithms, real-time communication platforms, and artificial intelligence have redefined the way organizations build relationships with their publics. In this context, the Public Relations (PR) function is no longer sufficient to be carried out through conventional approaches such as press releases, media relations, or face-to-face events. The digital landscape demands a

more measurable, adaptive, data-driven, and integrated approach across channels. Therefore, adapting PR strategies is a necessity so that organizations can survive and compete in a dynamic and competitive digital communication ecosystem (World Economic Forum, 2023).

Adapting PR strategies in the digital landscape covers various aspects, from shifting communication channels, changing content production patterns, to using analytical tools to measure message effectiveness. An effective PR strategy today is characterized by the organization's ability to personalize messages, build interactive dialogue with audiences, and manage issues responsively and in real time.

Furthermore, amidst increasing public expectations for openness and speed of information, the role of PR practitioners is becoming increasingly complex. They are required to not only be communicators, but also data analysts, digital content designers, and online reputation crisis managers. In Indonesia, as many as 212 million people are active internet users, with 170 million of them active on social media, according to the Digital 2024: Indonesia report (We Are Social & Meltwater, 2024). This shows that the digital space has become the main domain of interaction between organizations and the public. However, a survey by Kominfo (2024) indicated that there is still a gap in the use of digital technology by organizations, where 35% of institutions do not yet have a structured digital communication strategy (Ministry of Communication and Information of the Republic of Indonesia, 2024). This fact reinforces the urgency for organizations to update their PR strategies to remain relevant and effective amidst the acceleration of digital transformation.

The description above shows that rapid changes in digital technology that mark the Industry 4.0 era have triggered disruption in organizational communication practices, including public relations (PR) strategies. In facing these dynamics, literature review plays an important role as a scientific basis in understanding how organizations respond to changes in the communication environment strategically. A comprehensive literature review allows mapping of the transformation of PR strategy from a traditional model to a more adaptive, responsive, and data-driven digital approach. This is important to ensure that the strategies implemented are not only reactive to technology, but also based on theoretical and empirical reflections that can be academically accounted for (Grunig, J. E., & Hunt, T., 1984).

The relevance of literature review in this context becomes increasingly significant considering the pace of development of communication technology which often exceeds the speed of organizational adaptation. A review of various previous studies allows the identification of patterns of change, best practices, and challenges faced in the implementation of digital public relations (DPR). According to a report by McKinsey & Company (2023), many organizations are digitizing communication without a long-term strategy based on conceptual understanding, which results in ineffectiveness in reaching the target audience. Therefore, a review of the existing literature contributes to building a strong conceptual framework for developing relevant PR strategies in the digital era.

On the other hand, the high penetration of digital media in Indonesia emphasizes the urgency for organizations to adopt contextual literature-based PR strategies. The Digital 2024: Indonesia report shows that of Indonesia's 279 million population, around 212 million are active internet users and 170 million of them use social media intensively (We Are Social & Meltwater, 2024). However, based on the Kominfo report (2024), around 35% of

organizations do not yet have a strategic guide based on scientific studies in carrying out their digital communications, which results in a lack of consistency in building reputation and public trust (Ministry of Communication and Information of the Republic of Indonesia, 2024). Thus, literature studies play a crucial role in bridging the gap between practice and theory, as well as encouraging PR transformation that is not only technology-based, but also supported by a systematic academic foundation.

Through a literature review approach, this journal seeks to evaluate and synthesize various theoretical perspectives and empirical findings related to the adaptation of PR communication strategies in the Industry 4.0 era. This study is expected to contribute to the development of a relevant, effective, and future-oriented communication strategy model in the ever-changing digital landscape.

This study aims to review in depth the literature that discusses How to adapt communication strategies in digital Public Relations practices in the Industry 4.0 era. This study is directed at identifying strategic models, new approaches, and communication practices that emerge in the digital public relations (DPR) domain. Through a literature review approach, this study also attempts to compile a systematic mapping of various forms of PR strategy adaptation that are relevant to contemporary digital communication conditions. By critically reviewing theoretical and empirical references, this study is expected to provide a conceptual contribution to the development of innovative, responsive, and contextual PR communication strategies in facing the challenges of organizational communication in the digital era.

The research question is how have public relations strategies evolved in response to the demands of the Industrial Era 4.0. The urgency of this research is this study has a number of significant contributions both theoretically, practically, and in the policy realm. Theoretically, this study aims to contribute scientific references that enrich the literature on the transformation of public relations communication strategies in the digital landscape. By reviewing various perspectives and findings of previous studies, this study can be a conceptual basis for the development of strategic communication theories that are relevant to the context of Industry 4.0. From a practical perspective, the results of this literature review are expected to be a reference for public relations practitioners in developing communication strategies that are adaptive to technological changes, and are able to answer the needs of increasingly dynamic and data-based public communication. This study can help practitioners in choosing the right digital approaches and tools to build effective relationships with stakeholders. Meanwhile, from a policy perspective, this study provides insights that can be used by higher education institutions and communication training institutions to design public relations curricula that are more responsive to digital developments. Thus, this study contributes to the renewal of the direction of strategic communication education that is relevant to the demands of the digital transformation era.

2. METHOD

This study uses a qualitative approach with the Systematic Literature Review (SLR) method to identify, evaluate, and critically analyze various previous studies that are relevant to the topic of Digital Public Relations and adaptation of communication strategies in the

Industry 4.0 era. The research question is how have public relations strategies evolved in response to the demands of the Industrial Era 4.0. The SLR method was chosen because it is able to compile evidence systematically and transparently to answer the research questions that have been set. Qualitative research with the literature review method allows researchers to conduct a critical synthesis of previously published theories, concepts, and empirical findings, in order to build a systematic and relevant framework for thinking about research issues (Snyder, 2019).

The data collection process was carried out through a systematic search in various academic databases such as Google Scholar, ScienceDirect, SpringerLink, and Scopus, with keywords such as digital public relations, strategic communication, PR adaptation, communication in Industry 4.0, and literature review in communication studies. Furthermore, these sources were analyzed thematically (thematic analysis) to identify patterns, categories, and trends in PR strategy changes in the digital context.

The approach used is a systematic approach, which follows the stages according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The PRISMA diagram consists of four main stages, namely identification, screening, eligibility, and inclusion.

To ensure the focus and quality of the study, the inclusion criteria are set as follows: (1) Scientific articles published in the period 2014–2024, (2) Published in accredited journals or scientific proceedings, (3) Have direct relevance to the topic: Digital Public Relations, Strategic Communication, Industry 4.0, and (4) In English or Indonesian. Meanwhile, articles that do not meet the above requirements, such as editorials without scientific methods, duplicates, or topics outside the scope, are excluded from the selection process.

A literature search was conducted on four major databases: Scopus, ScienceDirect, SpringerLink, and Google Scholar, using Boolean keywords such as: "Digital Public Relations" AND "Industry 4.0", "Strategic Communication" AND "Public Relations", "PR Adaptation" AND "Industry 4.0", and "Digital PR" AND "Strategic Communication".

The article selection process followed the PRISMA 2020 flow, which consisted of four stages: (1) Identification: A total of 284 articles were found through the initial search, (2) Screening: After removing duplicates and checking abstracts, 220 articles remained, (3) Eligibility: A total of 75 articles were read in full to assess the suitability of the content, and (4) Inclusion: Finally, 20 articles were selected because they were relevant to the research focus. The selection flow diagram is shown in Figure 1.

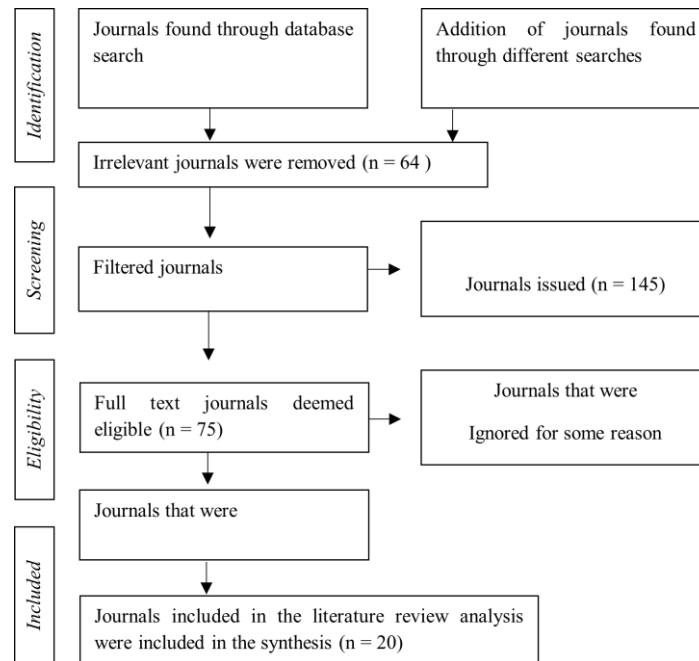


Figure 1. PRISMA diagram

3. FINDING AND DISCUSSION

After going through a rigorous selection process based on the Systematic Literature Review (SLR) protocol to ensure a transparent and replicable process in identifying, analyzing, and synthesizing relevant literature. Specifically, this study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol as a guideline. As many as 20 selected articles were further analyzed to answer research questions related to the adaptation of communication strategies in Digital Public Relations practices in the Industry 4.0 era. The research question is how have public relations strategies evolved in response to the demands of the Industrial Era 4.0. These articles represent a variety of methodological approaches, ranging from qualitative studies, bibliometrics, to global surveys, and reflect a variety of contexts such as government, corporations, higher education, and digital technology.

Literature analysis shows a consistent trend towards the importance of technology integration in modern PR practice. Some of the key issues that emerge include the use of social media, digital competence, artificial intelligence, crisis communication strategies, and reputation management in an increasingly complex digital ecosystem.

To provide a systematic overview of the contribution of each article, Table 1 is presented below, containing information about the author, year of publication, article title, research objectives, methodological approach, and relevance to the topic of study.

Table 1. Synthesis Table of Selected Articles

No	Author Name & Year	Article Title	Research Objectives	Method	Relevance to Topic
1	Adriantini et al. (2024)	Public Relations Strategies in the Digital Era Amid AI Development	Examining digital PR strategies amid AI developments	Qualitative Study	Highly relevant
2	Agustini et al. (2024)	Digital Media Utilization in Government Public Relations	Analyzing the use of digital media in government PR	Conference Paper	Relevant
3	An (2024)	The Role of Digital Media in Shaping Public Relations	Developing successful online communication strategies	Conceptual	Highly relevant
4	Aria Sataoen (2024)	The Evolution of Digital Public Relations Research	Examining the evolution of digital PR research using bibliometric analysis	Bibliometric	Highly relevant
5	Bernhard & Russmann (2023)	VR and AI in Digital Storytelling: PR Adaptation Strategies	Exploring the role of VR & AI in PR storytelling	Case Study	Relevant
6	Brockhaus et al. (2022)	PR Meets Industry 4.0: Strategic Communication in Smart Manufacturing	Classifying strategic PR technologies in Industry 4.0	Empirical Taxonomy	Highly relevant
7	Dühring & Brockhaus (2021)	Integrated Digital Public Relations Strategy in Smart Manufacturing	Analyzing PR strategy integration in smart manufacturing	Multi-case Study	Highly relevant
8	Dunan & Mudjiyanto (2024)	Government PR Strategy in the Era of Industry 4.0	Analyzing the communication strategy of the	Qualitative Study	Relevant

Indonesian government						
9	Evolving Human Resource (2020)	Evolving Dimension in Indonesia's Digital Landscape	HR in PR	Examining the role of human resources in Indonesia's digital PR landscape	Literature Study	Relevant
10	Gregory & Willis (2022)	Strategic Public Relations Leadership		Identifying strategic leadership in PR	Literature Study	Highly relevant
11	Kaya & Aras (2020)	Impact of Digital Communication and PR Models in Higher Education		Investigating PR communication sustainability in higher education	Survey	Relevant
12	Kretschmer & Winkler (2024)	Prospects and Risks of Digitalization in PR Research		Mapping digitalization narratives in PR research	Narrative Analysis	Relevant
13	Larsson & Wang (2023)	Digitalization in PR—Changing Competencies		Analyzing changes in professional competencies in PR	Longitudinal Analysis	Highly relevant
14	Meng & Lee (2021)	Digital PR Competencies for the Era of Industry 4.0		Identifying global digital PR competencies	Global Survey	Highly relevant
15	Permatasari et al. (2021)	Digital Public Relations: Trends and Required Skills		Describing trends and skills in digital PR	Literature Analysis	Highly relevant
16	Pribadi & Nasution (2021)	Digital Transformation to PR Sustainability in the Disruption Era		Examining PR profession sustainability in the disruption era	Discourse Analysis	Relevant
17	Purba & Indainanto (2024)	Digital PR: Managing Interactions and Building Reputation		Examining interaction management and digital reputation	Conceptual Study	Relevant

18	Rifandi & Irwansyah (2021)	Social Media in Digital Public Relations in Industry 4.0	Investigating the role of social media in digital PR	Qualitative Study	Relevant
19	Septiyani (2024)	Evolution of PR in the Digital Era	Examining PR strategies in building digital reputation	Literature Analysis	Highly relevant
20	Widodo (2024)	Strategic PR Communication in Higher Education	Case study on strategic communication in universities	Case Study	Relevant

Source: Data analysis results, 2025.

To comprehensively understand the landscape of digital public relations (PR) in the context of Industry 4.0, a thematic synthesis of 20 selected scholarly articles was conducted. The literature was grouped into five major themes: (1) the evolution and conceptualization of digital PR, (2) strategic communication and technology integration, (3) competencies and human resource development, (4) sectoral applications in government and higher education, and (5) the use of digital platforms and tools. This structure allows for a systematic comparison of findings and identification of research gaps.

3.1 Evolution and Conceptualization of Digital PR

Several studies focused on defining and tracing the transformation of digital PR. Aria & Sataøen (2024) conducted a bibliometric analysis to examine how digital PR research has evolved over time. Conceptual studies by An (2024) and Purba & Indainanto (2024) outlined frameworks for online communication and digital reputation management. Septiyani (2024) and Permatasari et al. (2021) highlighted current trends and necessary skills for digital PR practitioners.

Findings Comparison: These works emphasize the dynamic shift from traditional PR to digital PR, driven by technological advancement and changing public behavior. They attempt to align existing theoretical models with the demands of contemporary digital environments.

Research Gap: However, many of these studies remain theoretical. There is a lack of integrated models that bridge conceptual insights with actionable strategies applicable across organizational settings, especially in fast-changing digital ecosystems.

3.2 Strategic Communication and Technology Integration

This theme focuses on how emerging technologies such as AI, VR, and automation are shaping digital PR strategies. Adriantini et al. (2024) and Brockhaus et al. (2022) examined strategic communication in Industry 4.0, particularly in smart manufacturing. Dühring & Brockhaus (2021) discussed integrated PR strategies in high-tech industries, while Bernhard & Russmann (2023) explored VR and AI in digital storytelling.

Findings Comparison: These studies indicate that digital technologies are not only tools but also strategic assets in PR, enhancing interactivity and personalization. Industry-specific

applications, particularly in manufacturing and media, show innovative integration of AI-driven narratives and immersive storytelling.

Research Gap: Despite these advancements, existing studies lack comparative cross-industry analysis to evaluate the effectiveness of such strategies. Moreover, standardized implementation frameworks for technology-enhanced PR are largely absent.

3.3 Competencies and Human Resource Development in PR

As digital transformation reshapes communication roles, the need for new competencies has become a critical research concern. Larsson & Wang (2023) and Meng & Lee (2021) identified emerging digital competencies, while Evolving Human Resource (2020) addressed HR challenges in the Indonesian PR context. Gregory & Willis (2022) highlighted the need for strategic leadership in managing digital transitions.

Findings Comparison: These studies emphasize digital literacy, data analytics, and cross-platform communication as core competencies. Leadership that fosters innovation and adaptability is equally emphasized.

Research Gap: Most of the studies are broad or international in scope. There is a scarcity of research focused on regional or sector-specific competency frameworks, especially in emerging markets like Southeast Asia. Additionally, few studies propose systematic training models for digital PR skill development.

3.4 Sectoral Applications: Government and Higher Education

A number of articles address how digital PR strategies are implemented in specific sectors. Agustini et al. (2024) and Dunan & Mudjiyanto (2024) analyzed digital media utilization in government PR, while Kaya & Aras (2020) and Widodo (2024) focused on strategic PR communication in higher education.

Findings Comparison: Government agencies are increasingly adopting digital platforms to engage with the public, though with varying levels of sophistication. Similarly, higher education institutions use digital PR for branding and stakeholder engagement.

Research Gap: Sector-specific studies often operate in silos, lacking cross-sectoral comparisons. There is also limited discussion on measuring the impact of digital PR on institutional performance indicators such as public trust or enrollment growth.

3.5 Digital Platforms and Tools: Social Media and Narrative Control

Rifandi & Irwansyah (2021) investigated the role of social media in PR practices, while Kretschmer & Winkler (2024) discussed the narratives and risks involved in the digitalization of PR.

Findings Comparison: Social media remains a dominant force in PR, offering immediacy and wide reach. However, it also introduces challenges such as information overload and real-time reputation risks.

Research Gap: Few studies provide comprehensive frameworks for evaluating the effectiveness of social media-based PR strategies. There is also a need for deeper analysis of how organizations can maintain narrative control and brand consistency in volatile digital environments.

3.6 Positioning of the Current Study

This study seeks to fill several of the aforementioned gaps by offering an integrative literature review that not only maps existing knowledge but also connects theoretical and practical dimensions. It contributes by bridging theory and practice: offering a synthesis that aligns conceptual insights with current digital communication practices; clarifying strategic adaptation: examining how digital PR strategies are evolving within the context of Industry 4.0; encouraging future research: identifying underexplored areas such as regional digital competencies, cross-sector strategy comparisons, and the development of measurable frameworks for PR effectiveness.

By organizing the literature thematically and critically assessing its scope and limitations, this study provides a foundation for more focused and context-aware investigations into the transformation of public relations in the digital age.

4. CONCLUSION

This study has systematically reviewed and synthesized key literature on how public relations (PR) strategies have adapted to the digital transformation brought by the Industrial Era 4.0. The findings demonstrate a paradigm shift in PR practices—from conventional, one-way communication to interactive, data-driven, and technology-integrated approaches. The integration of digital tools such as social media, artificial intelligence, big data analytics, and automation has redefined how organizations engage with stakeholders, requiring new competencies and strategic frameworks.

The thematic analysis of selected literature reveals five major areas of focus: conceptual evolution of digital PR, strategic integration of emerging technologies, competency development for PR professionals, sectoral applications in government and education, and the role of digital platforms in shaping public narratives. While these studies have contributed valuable insights, they also reveal several gaps, including the lack of cross-sectoral analyses, limited regional studies, and the absence of standardized frameworks for evaluating digital PR effectiveness.

This study contributes to bridging the gap between theory and practice by offering an integrative synthesis that aligns conceptual understanding with practical application. It highlights the urgent need for organizations—especially in emerging markets like Indonesia—to adopt structured, evidence-based digital communication strategies that are contextually relevant and future-oriented.

Future research is encouraged to explore sector-specific adaptations, develop measurable evaluation frameworks, and design digital competency models tailored to different organizational contexts. As digital transformation continues to accelerate, the relevance and impact of PR strategies will increasingly depend on how well they are aligned with technological advancements and public expectations in the digital age.

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