

Artificial Intelligence and Public Relations Synergy in Digital Health Transformation

Strategic Insights and Ethical Considerations

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Indonesia devised a Digital Health Transformation Strategy Blueprint in 2024. The aim of the blueprint is to use the Indonesian Health Services (IHS) platform data to develop healthcare professionals' competencies and formulate sound, evidence-based policies. Nevertheless, there has been a failure to recognise the role of public relations (PR) practitioners in facilitating digital and artificial intelligence (AI) adoption in health transformation strategy. This research, therefore, applied a social-technological system of public relations and artificial intelligence to investigate the needs, skills, abilities and competencies of PR practitioners for digital health transformation, emphasising the use of AI in its application and the ethical considerations around that. The study employed a sequential mixed methods approach that involved focus group discussion (FGD) and survey design. It emerges that, among PR qualifications, organisational strategic support, adaptability to AI technologies, ability to design and execute AI data-driven communication campaigns, and analytical skills for AI applications are significant. The study found that autonomy, fairness in accessing personal information, and respect for roles were key ethical issues considered by PR practitioners. As such, this study stresses

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technical and analytic skills, including ethical concerns, which must be met by PR practitioners supporting digital health transformation.

Keywords: digital health transformation, artificial intelligence, social-technological system, competencies, ethical considerations, public relations

Introduction

In Indonesia, the blueprint for the Digital Health Transformation Strategy 2024 (Ministry of Health of the Republic of Indonesia, 2021) has, since its creation, become a roadmap that provides an overview to all relevant actors (such as stakeholders and healthcare industry players) of how Indonesia's digital health transformation will take place. The blueprint seeks to make all Indonesians healthier by involving every player from the various health service system sectors through the Indonesian Health Services (IHS) platform (Widyawati, 2022). By linking, analysing and servicing multiple healthcare applications, the IHS platform can create a digital health ecosystem for various essential health apps (Ishak, 2023).

Little attention is paid to the important role public relations (PR) practitioners play in this model for two-way communication and understanding. The Ministry of Health monitored registered companies, researching and closing deals to develop the design of the IHS system (Orissa International & Intralink Limited, 2025). Much messaging will have to be done on this platform so as not to allow the interest of customers to dwindle (Ministry of Health of the Republic of Indonesia, 2021). However, more needs to be said about the role public relations activities and skills play in digital health transformation (Weldon, 2024).

In the healthcare sector, the use of artificial intelligence by PR practitioners is not just another fashion, but rather a major breakthrough that changes everything (La Voie Health Science, 2024). Applying AI tools such as AI agent could cultivate better relationships between organisations and the general public (Oh & Ki, 2024). What AI does is that it helps in distributing information that can be easily understood by the public. For example, PR could use an AI-driven chatbot and a FAQ bot on the health service to engage people instantly in human-like conversations (Shah & Borkakoty, 2023). It provides specifically selected, accurate health messages that can be delivered quickly across many different media platforms to reach a wider population (SSG, 2023). With modern data analytics, PR practitioners can track public health trends (Robert, 2023). If problems occur, PR practitioners can respond to them through focused communication campaigns such as press releases or statements made promptly about the issues involved (Lim & Schmälzle, 2023); also, AI ensures the delivery of personalised messages about community health needs, thus increasing the effectiveness of any healthcare-related issue communicated (Oluwafemidiakhoa, 2023).

AI has compelled PR practitioners to assess the requirements of their situation day after day and upgrade their skills, abilities and competencies with regard to AI technologies while doing so (Adi, 2023). These advancements seek to optimise the deployment and maintenance of correct, understandable, transparent information intended for consumption by the general public (AIContentfy, 2024). This means that given the various applications based on AI technology, PR practitioners need to adapt accordingly to manage communications more

effectively (Rodsevich, 2023). Mastery of AI technologies has increased outreach towards a larger and more diverse audience, thereby providing better individualised informed services (Zhou, 2023). However, several ethical issues in healthcare founded on AI have been suggested for consideration by PR practitioners (Green, 2025) including, with regard to the use of artificial intelligence by PR practitioners, data privacy, accountability, transparency (Cusnir & Nicola, 2024), fairness and information accessibility (Elendu et al., 2023; Green, 2025). Thus, the proposed research questions are:

RQ1: What are the needs, abilities, skills and competencies that PR practitioners need to possess in relation to the use of artificial intelligence in the healthcare sector?

RQ2: What AI ethical considerations do PR practitioners implement in the healthcare sector?

The current study explores needs, abilities, skills and competencies, as well as ethical considerations among PR practitioners whilst they navigate digital health communication services using AI.

Literature review

Social-technical systems in public relations and artificial intelligence

The use of AI in the healthcare sector PR practice is an important topic for research purposes and practical implementation (Adi, 2023). We proposed that AI technology and PR practices in this sector could be analysed as socio-technical systems (STS). STS develop a framework within which to examine how people in a system interact with the respective technology to influence collective outcomes while being enveloped in a contextual environment (Emery, 1959). STS show that humans are connected in their work systems, specifically in strategic change plans for organisational development (Appelbaum, 1997). STS theory describes the behaviour of organisations and their members whilst providing critical insight into the relationships between people, technology and outcomes (Kull et al., 2013), and helps in developing an understanding of how the integration of AI and employees can generate competitive advantages for organisations (Wang et al., 2023).

STS theory has observed AI integration in organisations, combining the novelty and scope dimensions, and an organisational outreach method to develop an understanding of the integration process (Makarius et al., 2020). AI technology is increasingly being adopted in organisations, but managers and employees have negative perceptions and a lack of understanding regarding training (Frey & Osborne, 2017). Meanwhile, better understanding and integration of AI will help employees (Morandini et al., 2023) to address some of the negative perceptions and opportunities that may arise if companies focus on building socio-technical capital (Makarius et al., 2020).

The extension of socio-technical systems was observed from the integration of human and machine intelligence (Herrmann & Pfeiffer, 2023), which can only be achieved if organisations and individual workers keep abreast of developments (Mills et al., 2023). In

particular, organisational processes and outputs – such as decision-making workflows – directly influence the impact of AI in the workplace (Perifanis & Kitsios, 2023). This is important in terms of responding to pre-conditions; humans, therefore, are always aware of developments, as well as supporting the sustainable and reliable function of AI-based socio-technical processes (Herrmann & Pfeiffer, 2023).

In PR, STS focus on the significance of investigating and understanding the complex network relationship, as well as the interconnections between organisations and various stakeholders (Nurgaliyeva, 2023). STS show the relevance of multi-stakeholder partnerships in initiating service development (Kim & Yang, 2023). It requires the participation of members and diverse public organisations in solving technological and social problems (Büscher, 2022). Each participant should be allowed to make decisions and develop mechanisms to resolve problems in a manner that is beneficial to end users while also offering better value to stakeholders (Baxter & Sommerville, 2011). The active participation of PR in the decision-making process (Grunig, 2011) has significantly increased the role of individual social groups and organisations (Adi, 2023), a process initiating conditions for innovative development, as a pattern of evolution and STS growth (Moiseeva & Myatishkin, 2021).

Communication skills are an aspect of STS (Morrow & Fischer, 2013) because new communication and information tools support collaboration, provide accessibility and secure data inflow (Roth & Farahmand, 2023). STS show the connection between digital transformation and communication at both interpersonal and organisational levels, a specialised field of PR (Wuersch et al., 2023). The digital transformation causes PR practitioners to identify communication trends using the latest technology for business interests and societal benefit (Klewes et al., 2017). A recent STS study found that AI implementation in PR is related to the importance of dedicating time and adopting a human-centred or democratic approach (Christensen & Andersson, 2025).

Ethical considerations in AI for public relations in health

AI in health has been considered for ethical guidelines (World Health Organization, 2023; 2024) as well as PR (PR Council, 2023; Public Relations Society of America, 2023). This study elaborates on and discusses the ethics of AI and PR in healthcare. It is important to explain AI and PR ethics to facilitate the dissemination of complex information and clinical outcomes, to foster progress and build trust (La Voie Health Science, 2024).

In one example of ethics in the care sector, Immanuel Kant suggested an ethical approach based on professional roles and duties (Tseng & Wang, 2021), one of which is deontology, which focuses on telling the truth as a key point of ethical principles at work through universal moral obligations (Kant, 1987; 1997; 2015). Ross (2002) explains the significance of observing moral principles and rules in all actions using deontological ethics. PR also adheres to deontological ethics (Bowen, 2004a; Grunig, 2014). PR practitioners are responsible to organisations, the public and stakeholders, who evaluate every decision from their respective societal perspectives (Bowen, 2004b). The public is an inseparable part of the communication process (Bowen, 2013). PR practitioners fulfil the role of ethical advocates by recognising and respecting the information needs and interests of the people

(Place, 2010). PR practitioners should ensure that AI usage does not violate the principles of deontological ethics; for example, PR practitioners should comply with responsible moral rules and principles to protect users' data. PR practitioners must make sure that AI obtains and processes information only if it is fully consensual and authorised by the individual concerned (Yelne et al., 2023).

In Kantian ethics, human-centred approaches to artificial intelligence must prioritise the categorical imperative, autonomy of will, rational beings, human dignity and humanity as an end (Ulgen, 2017). WHO guidelines (2023) stipulate that AI health services ought to follow Kantian ethics by securing autonomy, enhancing security, ensuring transparency, promoting responsibility and guaranteeing equity (Bouderhem, 2024). In line with AI-related PR Council guidelines (PR Council, 2023), Kantian ethics is seen as safeguarding the integrity of information while appreciating roles, including a commitment to accuracy and transparency, diversity of values and openness in the profession, and also to enhancing public trust.

Method

The current research applied mixed methods (Fetters et al., 2013) to provide a comprehensive picture of the navigational and ethical considerations of PR in the AI-based healthcare sector. A sequential mixed method combining a qualitative approach with focus group discussion (FGD) and the quantitative approach with survey methods related to AI and PR recommended by a previous study (Dobrev, 2023). The FGD was conducted to establish the instruments or questionnaire (Esmailzadeh, 2020; Mazur & Bennett, 2008), while the survey was intended to collect empirical data to answer the research questions quantitatively (Esmailzadeh, 2020).

Once approval from the ethics committee had been gained, a number of PR practitioners who work in healthcare sectors were invited to be participants in the FGD. The invitations were issued based on the PR practitioners having attended a national meeting on health and public service at which the researcher had been a speaker. Once the contact list had been obtained and the selections made, PR practitioners from the Ministry of Health, the central hospital and the regional health service unit were invited to two FGDs. Each FGD had nine participants who were also expert in qualitative methods. Each FGD took 4–6 hours with two breaks for lunch and snack sessions. Two FGDs were conducted to formulate the variables and their indicators (Aldoor, 2001; Wong, 2008). The FGD process followed five steps: 1. establishing research objectives; 2. topic and question selection; 3. developing the guideline; 4. expert assessment; and 5. pilot FGD interview (Yaakop et al., 2023).

Five questions were attached to the first FGD invitation as research objectives that should be discussed during the given FGD session: 1. As a PR practitioner, what do you need in relation to the presence of AI in your work in the healthcare sector? 2. What abilities do you require of AI as a PR practitioner working in the healthcare sector? 3. What AI skills do you need as a PR practitioner working in the healthcare sector? 4. What competences in AI do you require as a PR practitioner working in the healthcare sector? 5. Explain what AI-ethical considerations you need to take into account as a PR practitioner working in

the healthcare sector? The questions were on AI in general (Beni et al., 2025) and covered AI tools such as chatbots, predictive analytics, natural language processing and sentiment analysis. During the FGD, facilitators interviewed the PR practitioners as part of an expert assessment. After the FGD, the facilitators and the researcher established the guidelines and the draft questionnaire particularly with regard to the need for an AI presence, the capabilities of AI, AI skills, AI competencies and AI ethical considerations. The researchers added operational definitions for the five observed variables from specific references.

The same PR practitioners who had participated in the previous FGD were also invited to the second. Attached to the invitation was a draft of the questionnaire, along with the operational definition of observed variables (such as need, ability, skill, competencies and ethical considerations) from previous studies (Buttle, 1989; Nagarajan & Prabhu, 2015; Rodrigues et al., 2021; Dhirani et al., 2023), including items or indicators. During the FGD session, the participants were interviewed and their expert judgement was sought on the abovementioned proposed observed variables and their items or indicators.

With regard to the *need variable* for PR practitioners in the healthcare sector in relation to the presence of AI, the FGD participants agreed to adopt Buttle's definition: *needs refer to everything an individual or organisation requires to achieve certain objectives* (Buttle, 1989). In the FGD session, participants not only conveyed the need for an AI presence in concrete and measurable forms, but also in terms of perceptions, personal experiences and dynamic collective aspirations. The participants agreed that the variable on the need for an AI presence that would be presented to PR practitioners consist of four items: 1. technological infrastructure; 2. number of staff aware of the existence of AI; 3. availability of AI-based software; 4. policies; and 5. organisational strategies that support the implementation process.

In terms of AI abilities for PR practitioners, the FGD participants agreed on a definition that stems from that of Nagarajan and Prabhu: *ability is the capacity of an individual or organisation to carry out a task or activity effectively* (Nagarajan & Prabhu, 2015). One of the participants said that the definition was related to AI operational clarity in assessing performance, emphasising the real capacity aspects of knowledge, skills and resources that are needed to achieve results effectively. The participants agreed that the ability variable that PR practitioners should possess were: 1. AI technology understanding; 2. AI-based data analysis techniques; 3. Natural Language Program (NLP) understanding; 4. machine learning algorithms understanding; and 5. adaptability to developments in AI technology.

In terms of PR practitioners' AI skills, the FGD participants agreed with the definition from Rodrigues, Fernández-Macías and Sostero: *skills are the practical expertise possessed by individuals to perform certain tasks properly* (Rodrigues et al., 2021). The FGD discussion determined that the definition of skills would be based on conceptual and functional relevance in the context of measuring work skills and productivity, particularly concerning AI. The definition emphasises that skills are not just related to theoretical knowledge, but involve practical expertise that can be applied directly in carrying out certain tasks or jobs. According to one participant, skills are assessed from their ability to produce appropriate and efficient performance in real-life situations while interacting with AI applications. The FGD participants agreed that PR practitioners should be asked about their skill in 1. using AI-based software; 2. reading or understanding the output from AI systems; 3. designing and implementing AI data-based communication campaigns; 4. interaction with the public

through AI-based platforms; 5. generating AI system-based evaluation reports; and 6. follow up on AI system-based evaluations.

With regard to PR practitioner competency in AI, the FGD participants agreed with the definition from Rodrigues et al. (2021) which sees *competency as a combination of knowledge, skills, and attitudes required to perform a particular task or role effectively* (Rodrigues et al., 2021). According to one of the participants, this definition not only emphasises cognitive (knowledge) and psychomotor (skills) aspects, but also includes affective (attitude) aspects, which are often the determinants of success in the real-life application of abilities, particularly with AI applications. The participants also decided that PR practitioners should be asked about their 1. knowledge of the basic principles and applications of AI in PR; 2. analysis skills of AI applications in PR; 3. skills in integrating AI data in communication strategies; 4. commitment to PR professional ethics; 5. health ethics; and 6. policy regulations.

Finally, in terms of AI ethical consideration for PR practitioners who work in the healthcare sector, the FGD participants agreed with the definition from Dhirani, Mukhtiar, Chowdhry, and Newe which defines *ethical considerations as the moral aspects and values that must be taken into account when using AI technology* (Dhirani et al., 2023). One participant reasoned that the definition emphasises the importance of the ethical dimension as an integral component in the design, implementation and utilisation of AI technology. The participants agreed that PR practitioners should answer items on AI ethical considerations about 1. data privacy; 2. fairness in access to personal data; 3. responsibility in protecting personal data; 4. autonomy; 5. moral responsibility; 6. commitment to accuracy; 7. accessibility; 8. transparency; 9. respecting roles; and 10. commitment to increasing public trust.

The two FGDs succeeded in constructing a questionnaire to answer the research questions, with each of the observed (needs, abilities, skills, competencies and ethical consideration) variables measured using a Likert scale from 1. very unimportant to 5. very important (Henke, 2024). The final sentences of five observed variables and their items were verified by four expert PR practitioners. The average content validity ratio (CVR) value of all components in the designed questionnaire was 0.9, a value indicating evidence of good content validity (Gilbert & Prion, 2016).

The two FGDs also interviewed the PR practitioners to identify any particular AI tools in PR that are used in the healthcare sector. The result of the interview about *AI technology identified and used by PR practitioners* can be seen in the attached Appendix.

After pre-testing the questionnaire, the survey was conducted online through a link to a list of 420 potential participants from the Ministry of Health database of PR practitioners. Furthermore, of the 420 potential participants whose consent was requested through email and WhatsApp, 216 participants responded (a 51.2% response rate) and were willing to fill out a consent form.

The collected quantitative data of all the variables under observation were analysed using SPSS version 24 (Irwansyah, 2024). These observed variables were measured for both reliability and validity utilising Cronbach Alpha (Emerson, 2019; Tavakol & Dennick, 2011), as well as confirmatory factor analysis (Alavi et al., 2020; Buchanan et al., 2014). Descriptive statistical analysis was employed to illustrate the indicators of each respective variable (Henke, 2024). Furthermore, the gender basis served to compare needs, abilities, skills, competencies and ethical concerns, and could be based on other research, such as

that which considers AI bias in relation to gender (Latif et al., 2023), disparities in the implementation gap between genders (Mourelatos et al., 2024), or differences in AI use in healthcare services (Cirillo et al., 2020; Ofosu-Ampong, 2023). On this note, a t-test was performed to compare these genders (Kumar & Choudhury, 2022; Latif et al., 2023).

Results and discussion

Results

The respondent profile in Table 1 shows that the majority are female (55.6%) and between 24 and 39 years old (72.7%). Most of the respondents (74.1%) had a bachelor’s degree, and a similar proportion (73.7%) reported a basic earned income above 3.6 million rupiah per month, which represents a low average professional salary threshold, considering that in Indonesia’s 2025 salary range the lowest average is IDR 3,200,000, the median salary is IDR 11,700,000 and the maximum salary exceeds IDR 54,000,000.

Table 1:
Respondent Profile

Variable	Indicator	Frequency (N = 216)
Sex	Female	55.60
	Male	44.40
Age	Below 23 years old	10.20
	24–39 years old	72.70
	40–55 years old	17.10
Education	Vocational degree	13.40
	Bachelor’s degree	74.10
	Master’s degree	12.50
Basic income Per month	Below 3.5 million	26.40
	3.6–4.5 million	37.50
	4.6–5.5 million	26.90
	Above 5.6 million	9.30

Source: Compiled by the author.

All observed variables were highly reliable, as shown in Table 2 ($\alpha = 0.99$, sig. = 0.00, N = 216), which suggests that the measurement instruments were consistent. Similarly, ethical considerations about AI were used to attain the highest and the lowest values of its validity ($\lambda = 0.97$, df = 45, approximate Chi-square = 5,507.46) and needs and abilities regarding AI; ($\lambda = 0.93$, df = 10, approximate Chi-square = 2,329.52–2,343.42, N = 216).

Table 2:
Reliability and validity of observed variables

Variable	Reliability (α)	Validity (λ)	df	Approx. Chi-square	N
Need for an AI presence	0.99	0.93	10	2,343.42	216
Ability with AI	0.99	0.93	10	2,329.52	216
Skill with AI	0.99	0.95	15	2,804.47	216
Competence with AI	0.99	0.94	15	3,006.62	216
Ethical considerations of AI	0.99	0.97	45	5,507.46	216

Source: Compiled by the author.

The findings on the need for an AI presence laid out in Table 3 show that the majority of the respondents consider a variety of aspects that support the implementation of this technology to be important, fairly important and very important. Meanwhile, 63.40% of the respondents (with 37.50% considering it important, 25.90% fairly important and 6.90% very important) considered the organisational strategy that supports AI implementation to be the most important indicator.

Table 3:
Need for an AI presence

Indicators	Important	Fairly important	Very important	Mean	SD
Technological infrastructure	34.70	26.90	8.30	3.05	1.07
Number of staff who have AI knowledge	36.60	25.90	7.40	3.04	1.01
Availability of AI-based software	34.70	26.40	7.90	3.05	1.02
Organisational policies that support AI implementation	35.60	25.50	7.90	3.03	1.05
Organisational strategies that support AI implementation	37.50	25.90	6.90	3.03	1.01

Source: Compiled by the author.

Based on the findings on AI ability shown in Table 4, the majority of the respondents considered a variety of aspects of understanding and adaptability to AI technology to be important, fairly important and very important. The ability to adapt to developments in AI technology was considered the most important by 63.90% of the respondents (38.00% considered it important, 25.90% quite important and 6.50% very important).

Table 4:
Knowledge about AI

Indicators	Important	Fairly important	Very important	Mean	SD
Understanding AI technology	35.20	26.90	7.90	3.04	1.06
Understanding technical AI-based data analysis	37.00	25.90	6.90	3.03	1.01
Understanding Natural Language Processing	35.20	26.40	7.40	3.05	1.01
Understanding machine learning algorithms	36.10	25.50	7.40	3.02	1.04
Adaptability to development in AI technology	38.00	25.90	6.50	3.03	1.01

Source: Compiled by the author.

The AI skills presented in Table 5 were seen differently by most respondents, according to whom, some elements that are necessary in order to use and understand artificial intelligence are crucial, while others are fairly significant or very significant. The majority (68.50%) of the participants felt that having the capacity to develop and run AI-driven data-focused communication campaigns was essential (41.20% thought it was important, 21.30% fairly important and 6% found it very important).

Table 5:
Skill with AI

Indicators	Important	Fairly important	Very important	Mean	SD
Ability to use AI-based software	41.20	19.00	6.90	2.96	0.99
Ability to read or understand the output from AI systems	40.70	20.80	6.50	2.96	0.99
Ability to design and implement an AI data-based communication campaign	41.20	21.30	6.00	2.96	0.98
Ability to interact with the public through an AI-based platform	39.4	19.40	7.90	2.96	1.01
Ability to develop an evaluation report based on an AI system	39.4	21.30	7.40	2.99	1.01
Ability to follow up an evaluation report based on an AI system	39.80	19.90	7.40	2.94	1.02

Source: Compiled by the author.

With regard to competence in AI, Table 6 indicates that the majority of the respondents considered various aspects of knowledge and commitment to ethics and regulations in the application of AI to be important, fairly important and very important. Competencies such as analytical skills in the application of AI in PR are the most essential, rated as important by 79.90% of the respondents (51.20% considered it important, 20.80% fairly important and 7.90% very important).

*Table 6:
Competence in AI*

Indicators	Important	Fairly important	Very important	Mean	SD
Knowledge of basic principles and application of AI in public relations	40.70	19.40	8.30	2.95	1.07
Analytical skills in AI application in public relations	41.20	20.80	7.90	2.97	1.05
Integrated skills in AI data for communication strategies	38.40	21.80	7.90	2.96	1.07
Commitment to professional ethics in public relations	39.80	19.40	7.90	2.93	1.06
Commitment to ethics in healthcare	38.90	23.10	7.40	2.97	1.07
Commitment to policy regulations	42.60	21.80	6.90	2.96	1.04

Source: Compiled by the author.

As is apparent in Table 7, many of the respondents regarded the ethical considerations of AI as important, fairly important, or very important. Autonomy was noted as most essential by 71.20% of the respondents (38.40% considered it important, 26.90% fairly important and 5.60% very important).

The comparison results based on the t-test between gender and all the indicators of observed variables (needs, abilities, skills, competencies and ethical considerations) shown in Table 8 demonstrates significant differences between the female and male groups in only two indicators. The first of these is fairness in access to personal data, where the average rating for both females and males was 3.17 and 2.94, respectively. Furthermore, with t-statistic and p-values of 0.21 and 0.04, this difference is statistically significant, implying that females tend to have a more positive view of the fairness of access to personal data compared to males. With regard to respect for roles, the second indicator shows the average rating for both males and females at 3.09 and 2.94 respectively, with a t-statistic of 0.73 and a p-value of 0.03, thus indicating that there are significant differences between female and male respondents concerning what they considered fair access to personal data, and respect for roles in an organisation.

Table 7:
Ethical considerations of AI

Indicators	Important	Fairly important	Very important	Mean	SD
Data privacy	37.20	26.00	6.00	3.00	1.01
Fairness in access to personal data	38.00	28.20	4.20	3.00	0.98
Responsibility for protecting personal data	36.60	26.90	6.00	3.00	1.03
Autonomy	38.40	26.90	5.60	3.01	1.01
Moral responsibility	35.60	27.80	6.50	3.04	1.01
Commitment to accuracy	38.90	26.40	5.60	3.00	1.01
Openness	37.00	27.80	6.00	3.03	1.02
Transparency	36.10	27.30	6.00	3.01	1.02
Respect for roles	36.60	26.40	6.00	3.00	1.02
Commitment to increase public trust	37.00	26.90	5.10	2.99	1.00

Source: Compiled by the author.

Table 8:
T-test results for two significant indicators of AI ethical considerations

Indicators	Group 1 Mean (Female)	Group 2 Mean (Male)	T-statistics	df.	P-value
Fairness in access to personal data	3.17	2.94	0.21	214	0.04
Respect for role	3.09	2.94	0.73	214	0.03

Source: Compiled by the author.

Discussion

The current research explored the needs, abilities, skills, competencies and ethical considerations required by PR practitioners to use AI in the healthcare sector. With regard to the need for an AI presence, it is critical that health PR practitioners get support from organisational strategies to help with the AI implementation process. This corresponds to previous studies (Verhoef et al., 2021) which have reported that AI deployment in healthcare has led to increased operational effectiveness and facilitated knowledge acquisition through sophisticated data analytics. For organisations to gain the greatest benefits from this technology, an organisational strategy driven by artificial intelligence is a must. In terms of the STS perspective, the organisation could gain a competitive advantage if employees such as PR practitioners integrate AI (Wang et al., 2023) in their

working system (Appelbaum, 1997). Furthermore, AI technologies in PR can also be utilised for crisis communication management, public sentiment analysis, creating personalised messages, and reinforcing results by emphasising the implementation process (Fan & Gordon, 2014). The practical implementation of AI also relies on a distinct organisational strategy and backing from top levels of management (Davenport & Ronanki, 2018).

Additionally, AI deployed in PR can help in the management of crisis communication activities, analysing public sentiment and customising messages. Among the STS aspects, PR healthcare communication skills (Morrow & Fischer, 2013) and strategies will significantly benefit from the implementation of AI; going through the process can provide significant advantages (Fan & Gordon, 2014). The successful implementation of AI relies on a clear organisational strategy and support from upper management levels (Davenport & Ronanki, 2018). Without a well-planned strategy, the AI implementation process in PR activities may face obstacles such as employee resistance and operational ambiguity that are detrimental to a healthcare sector in dire need of reliability and precision (Brougham & Haar, 2018).

The current investigation identified the awareness of PR practitioners to the importance of in-depth understanding and adaptability in various aspects of AI technology in supporting the effective implementation of communication strategies in the healthcare sector. This is in line with previous research from the Brookings Institution (West & Allen, 2018) that showed that in-depth knowledge of AI technology is essential in ensuring that the implementation process goes smoothly and produces the expected results. Another such study (Ransbotham et al., 2017) showed that adaptability to AI technologies is one of the main factors in successful adoption. From an STS perspective, individuals and organisations that adapt quickly to technological changes tend to take advantage of the opportunities offered by AI (Morandini et al., 2023). Adaptability could thus assist in reducing resistance to change, often regarded as one of the major barriers to the implementation of new technologies (Kotter, 1995). In another study, Huang and Rust (2018) also identified that PR practitioners required a sound knowledge of AI technology in order to design and implement effective communication strategies.

The current research demonstrates that healthcare-related PR practitioners understand the importance of skill in building AI data-driven communications strategies to support efficient implementation. This supports an earlier study by van Dijck et al. (2018) that showed the increasing importance of data analysis and AI applications in the digital age. AI applications can assist in data collection, processing and interpretation, potentially generating useful data to engender more effective and targeted communication campaigns. The STS perspective identified the ability to understand and optimise data as one of the main factors for success in modern data communications management (Akbarighatar et al., 2023). The analysis of data by PR practitioners who are experts in the digital health sector can boost viewership trends and become a preference among audience members (DiMaggio & Hargittai, 2001). Furthermore, AI-led communication campaigns can raise participation rates among users. Utilising AI algorithms in the creation of messages allows companies to generate content that is interesting and relevant for particular people, sustaining their confidence and allegiance (Kumar et al., 2024). These skills may increase the trustworthiness and accuracy of information. The integration of an understanding of AI applications and the development of a communication strategy may also contribute to the success of a PR

career. AI applications enable Public Relations experts to pre-empt audiences' behavioural trajectories so as to create more anticipatory and data-based campaigns (Adi, 2023). Through the incorporation of AI into public relations communication strategies, organisations can undertake proper predictive analysis and adjust their campaigns according to market dynamics (Pal, 2024). The usefulness of AI-based data analytics on communication campaigns comes in obtaining results and making better strategic decisions than others (Shah & Borkakoty, 2023).

The findings show the significance of analytical capabilities with AI applications for PR practitioners in the healthcare sector because they enable more efficient data-driven decision-making and management. A previous study of the STS perspective showed that data-driven decision-making is of paramount importance in effective knowledge management practice (Thomas, 2024). AI technology assists PR practitioners by automating mundane chores, and at the same time by offering profound insight into health trends and patient behaviour which in turn helps in the development of effective communication strategies (Zararsiz, 2024). Moreover the implementation of AI in public relations can effectively enhance the activity of content creation and data analysis (Lipschultz et al., 2022), and the use of AI applications can allow PR practitioners to concentrate and prioritise strategic tasks (Meng et al., 2024). The use of AI technology in media monitoring and public sentiment analysis eliminates many time-consuming tasks, and an examination of artificial intelligence applications could provide important feedback on public opinion, as well as creating better ways of managing reputation by interpreting specific trends that can improve future strategies within this area (Davies, 2024).

Zirar et al. (2023) argue that although AI helps in data analysis as well as automation, creativity and understanding are indispensable in PR when it comes to creating an evocative narrative that carries emotional weight (Meyer, 2023). If effective and meaningful communication are to occur, Markauskaite et al. (2022) posit that human skills need to be blended with artificial intelligence-powered analytical capabilities. From the STS perspective, the blend between human skill and AI-powered analytical capabilities may bring better instrumental and humanistic objectives (Akbarighatar et al., 2023). Another previous study also found that the blended skill could facilitate crisis management by analysing real-time data and giving automated feedback, which is especially useful in maintaining consistency in communication while offering insights for strategic realignments (Biswal, 2020).

This study found that autonomy is one of the main AI ethical considerations for PR practitioners in their healthcare service work. As previous studies on healthcare service have shown, autonomy is crucial for other practitioners in the health service, such as medical personnel, because of AI algorithms (Naik et al., 2022). In the context of health care, autonomy means that individuals, whether they are practitioners or patients, should have full control over the healthcare system and medical choices (Mennella et al., 2024). Another study discovered that AI can undermine patient autonomy by limiting direct engagement with healthcare practitioners (Morley et al., 2020). Nonetheless, the introduction of AI into healthcare must be handled cautiously to ensure that it supplements rather than substitutes medical professionals. Still, earlier investigations posited that autonomy within an AI setting relates to two actors (Grote & Berens, 2020). PR practitioners in the healthcare sector need to maintain ethical standards while also being driven by technological changes, making autonomy a critical ethical consideration (Ayinla et al., 2024). This was achieved by

including this balance in PR guidelines that specify ethics in the use of AI (Public Relations Society of America, 2023). Consequently, PR officials' ethical considerations regarding the use of AI led to bilateral communication, as well as public knowledge about medical care delivery (Adi, 2023).

In the context of AI ethical considerations, both female and male PR practitioners had differing perceptions of the fairness of personal access and respect for roles. Females had more positive ratings on these two indicators of AI ethical considerations. The results of the current study, therefore, support the 2020 Report of the European Institute for Gender Equality, which indicated that more than 54% of females had a positive view of AI tools (Barbieri et al., 2020). Another study also showed that females were more concerned about ethics in AI (Mourelatos et al., 2024).

In terms of digital health transformation, from the STS perspective, this study recognised that PR practitioners would interact with AI technology not only in the healthcare sector but also in the health communication sector. As a part of organisational strategic support, the classical behaviour of an organisation may change dynamically, leading to competitive advantages (Wang et al., 2023) in digital health transformation. A better understanding of management would develop AI training for healthcare and PR practitioners (Nurgaliyeva, 2023); and the integration of an AI technology training process (Makarius et al., 2020) to develop the abilities, skills and competences of PR practitioners in the health sector would enhance better health communication service at the interpersonal or organisational levels (Wuersch et al., 2023). At the same time, new AI-based communication and information tools (Roth & Farahmand, 2023) could transform the modelling of public health services (Carter et al., 2020), including the ethical guideline on health (World Health Organization, 2023; 2024) and public relations (PR Council, 2023; Public Relations Society of America, 2023). PR practitioners with AI competences could integrate the communication process without violating the principles of deontological ethics (Yelne et al., 2023) such as autonomy, fairness in access to personal data and respect for roles.

Conclusion

This research succeeded in demonstrating the importance of needs, abilities, skills and ethical considerations that PR practitioners should possess when using AI in the healthcare sector. The findings of this study underscore that the application of artificial intelligence in public relations practice within the healthcare sector requires the fulfilment of essential needs, including technological infrastructure, AI-based software and supportive organisational policies and strategies. In terms of abilities, practitioners must possess advanced literacy in AI technologies such as machine learning and natural language processing, along with strong adaptability to ongoing technological developments. The skills required involve mastery of AI tools, the capacity to interpret system outputs, and the design and evaluation of data-driven communication campaigns. Furthermore, the core competencies encompass advanced analytical skills, the integration of data into communication strategies, and a commitment to professional ethics and healthcare regulations.

The findings were particularly relevant because they concentrated on how scientific and technical information should be conveyed to practitioners, enabling the effective and ethical adoption and use of AI technologies. In terms of the STS perspective, PR practitioners require an organisational strategy that supports the implementation process, as well as the ability to adapt to developments in AI technology. PR practitioners should also have specific skills, such as in the design of AI data-driven communication campaigns and analytical skills with regard to AI applications.

AI ethical considerations, namely autonomy from clients and fairness in access to personal data, are crucial aspects that should be understood and implemented by PR practitioners in the healthcare sector. PR practitioners should be aware of the ethical implications of AI use, including the maintenance of public trust during digital health transformation. Aside from that, this research also found gender differences in perception, with females having more positive ratings on the two indicators of ethical considerations concerning AI in the healthcare sector.

This research had several limitations that affect the validity and generalisability of the findings. The FGD process through which the instrument or questionnaire for data collection was established may have been biased by the researcher's own interest. The data collection method (the survey) could also have been affected by participant bias in which responses conform to social and professional norms, rather than reflecting actual experience, which could affect the accuracy of the data. Furthermore, this research focused on needs, abilities, skills and competencies, including ethical considerations about AI technology in general, while other factors such as organisational culture and policy support considered relevant for the successful integration of AI and specific AI tools were not discussed in-depth. Future investigations should cover these various aspects to provide a comprehensive picture that can be widely applied. In terms of methodology, the variables of need, ability, skills and competencies regarding AI have not yet been elaborated in specific terms. Future studies could extend into multivariate analysis such as factor analysis to create integrated terms for the variables.

AI technology has developed rapidly; in consequence, the findings of this research might quickly become outdated. Practitioners and organisations should continually update relevant knowledge and skills. This suggests the need for ongoing ethical assessment as technology advances. Although this investigation provided practical recommendations, the implementation in real-life contexts faces challenges such as resistance to change, budgetary constraints and lack of management support. Future research is needed to explore effective strategies for overcoming these obstacles while ensuring the successful integration of AI in PR.

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Appendix

AI technology identified and used by PR practitioners

AI technology	Application in healthcare sector	Example AI tools
Natural Language Processing (NLP)	Analysing public perceptions of hospitals, vaccinations and health policies on social media.	Drone Emprit, NoLimit, Prosa.ai
Chatbot and Conversational AI	Patient information services, questions and answers about Covid-19, immunisation, or hospital registration.	Halimun (Kemenkes RI), Botika AI, Qiscus Chatbot
Generative AI (AI for Content)	Create health education content such as articles, Instagram captions and press releases.	ChatGPT (used by private hospital PR content teams and agencies), Writesonic
Predictive Analytics and Crisis AI	Predicting crisis issues such as viral patient complaints or hoaxes about hospitals and vaccines.	Brandwatch Indonesia, Meltwater Jakarta, NoLimit Dashboard
Sentiment and Monitoring Analysis	Monitor hospital news, patient feedback on Google Reviews and trending health topics.	Drone Emprit Academic, Sociov, NoLimit, Komunika
Computer Vision (image processing)	Verifying health campaign visualisation, monitoring hospital image content.	Google Vision AI (via developer API), Clarifai (via local startup partnership)
Speech-to-Text / Voice Recognition	Transcripts of doctor interviews or patient testimonials for video/audio content PR purposes.	Google Speech-to-Text, Otter.ai, Prosa.ai (local)
Personalised Messaging AI	Sending immunisation reminders, specific service promotions to certain patient segments via WhatsApp/SMS/email.	Qiscus Omnichannel, Twilio API (integrated by major hospitals), OneSignal Indonesia
Multimodal AI (text, image, voice)	Interactive educational videos about Covid-19, healthy lifestyle promotion, mask usage, etc.	Pictory AI, Lumen5, Canva AI (widely used by private hospitals and healthcare startups)
Explainable AI (XAI)	Transparent explanation of AI results in diagnosis, used in public education by PR hospital.	Not yet widely used explicitly in PR, but this concept has begun to be introduced by the Indonesian Ministry of Health in public communications regarding medical AI.

Source: Compiled by the author.