

Human AI communication (HA-C): Transforming the role of technology in human interaction



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Abstract The development of artificial intelligence (AI) has created a paradigmatic transformation in human communication, from the era of Computer-Mediated Communication (CMC) to AI-Mediated Communication (AI-MC). This conceptual article uses a narrative review approach to explore the evolution of AI from a passive communication tool to an active communication agent capable of making decisions and influencing interaction outcomes independently. This study develops a Human-AI Communication (HA-C) framework that includes a four-level hierarchical model of AI agency: reactive agent, adaptive agent, proactive agent, and strategic agent. The introduced concept of distributed agency demonstrates that communication agency is no longer a human monopoly but can be distributed between humans and AI through mechanisms such as context analysis, intent recognition, response generation, and continuous evaluation. The research identifies complex ethical challenges including transparency, accountability, data privacy, algorithmic bias, and AI hallucinations. The international regulatory landscape shows significant fragmentation, with the EU developing a comprehensive AI Act while many countries are still in the early stages of developing regulatory frameworks. The HA-C framework contributes to communication theory by expanding the concept of agency beyond a human-centric perspective and introducing active mediation. The future vision points toward a symbiotic human-AI relationship that enhances communication capabilities while preserving fundamental human values.

Keywords: AI-mediated communication, communication agent, artificial intelligence (AI), ethical transparency, AI decision maker, human-AI interaction

1. Introduction

The communication technology revolution has undergone a fundamental paradigmatic transformation in the last two decades, creating profound changes in the way humans interact and communicate. This evolution started from the linear era of conventional telecommunications, progressed through the phase of Computer-Mediated Communication (CMC) enabling digital interactions, to enter a new era dominated by Artificial Intelligence (AI) as an integral component in the modern communication ecosystem (Adigwe et al., 2024; Cardon, 2023). This recent transformation does not simply represent technological evolution, but rather creates a communication paradigm that is fundamentally different from previous models.

In the context of traditional technology-mediated communication, communication devices such as telephones, emails and early generation social media platforms acted as passive mediators - channels that facilitated the transmission of messages without having the capacity to influence, modify or optimize the content of the communication itself. Technology in traditional CMC models functions as a neutral channel, where complete control over messages, communicative intent, and interaction strategies are entirely within the control of human actors (Hancock et al., 2020). However, the emergence of AI with adaptive learning capabilities, advanced natural language processing, and complex predictive algorithms have revolutionized this dynamic.

Contemporary Artificial Intelligence (AI) no longer functions as a passive tool, but rather has evolved into an active communication agent that has the capacity to make communicative decisions autonomously, modify messages based on contextual analysis, and even generate communication content completely independent of human input. This phenomenon gave birth to a new concept in communication studies known as AI-Mediated Communication (AI-MC), a paradigm in which AI not only mediates communication between humans, but also actively participates as communicative actors who have agency in determining the direction, purpose, and outcome of the interaction process (Hancock et al., 2020; Rezwana & Maher, 2022).

This transformation of AI's role from passive mediator to active agent can be observed in various application contexts. In customer service, AI no longer simply channels consumer queries to human operators, but autonomously analyzes the complexity of the problem, adjusts communication styles based on consumers' emotional profiles, and provides personalized solutions without human intervention (Newman & Gopalkrishnan, 2023). In the context of digital marketing, AI is capable of



designing highly targeted communication campaigns, optimizing messages based on real-time behavioral data analysis, and even predicting audience responses before messages are deployed (Verma et al., 2021a; Bag et al., 2022).

More significantly, AI has demonstrated the ability to develop complex communicative relationships with users through the phenomenon of parasocial relationships, where individuals develop one-way emotional bonds with AI entities, creating communication dynamics that resemble interpersonal interactions even though one of the parties is an algorithmic system (Lee & Park, 2022). This phenomenon indicates that AI not only acts as a communication tool, but also as a communicative partner capable of influencing the emotional and psychological aspects of the human communication process.

However, this evolution of AI as an active communication agent also presents unprecedented ethical and social complexities. When AI has the capacity to modify messages, optimize content based on specific goals, and even manipulate emotional responses, fundamental questions arise about transparency, accountability, and authenticity in AI-mediated communication (AI-MC) (Guzman & Lewis, 2020; Hine & Floridi, 2023). The problem of AI hallucination—a phenomenon in which AI generates convincing but factually incorrect information—adds a layer of complexity in understanding the reliability of AI-mediated communication (AI-MC) (Ji et al., 2022).

In addition, the use of AI in communication also raises issues of data privacy, cultural homogenization, and potential algorithmic biases that can affect fairness and inclusiveness in the communication process (Sarwari et al., 2024; Zdravkova et al., 2022). In the context of cross-cultural communication, AI has the potential to homogenize communicative norms and reduce the richness of cultural diversity that is an intrinsic characteristic of human communication (Agarwal et al., 2025).

Given the complexity and significance of this transformation, a comprehensive theoretical understanding of how AI is changing the fundamental nature of human communication is needed. Existing research in this area is fragmented and has yet to integrate the various dimensions of the changes taking place within a coherent theoretical framework. The majority of studies have focused on the technical aspects of AI implementation or the impact of specific applications, but have not systematically explored the theoretical implications of AI's transformation as a communication agent for our understanding of communication itself.

Therefore, this article aims to develop a comprehensive theoretical-conceptual framework regarding the transformation of AI's role in human communication, specifically the evolution from the traditional CMC paradigm towards AI-MC as a new communication model. Specifically, this article will: (1) analyze the evolution of communication technologies from passive mediators to active agents; (2) develop a conceptual framework for understanding the degree of AI agency in communication; (3) identify and analyze the ethical, legal, and cultural challenges arising from AI-MC; and (4) formulate the theoretical and practical implications of this transformation for the future of human communication.

The main theoretical contribution of this article is the development of a Human-AI Communication (HA-C) model that integrates communication, technology, and ethics perspectives in understanding the dynamics of communication in the AI era. This model not only maps the transformation that is taking place, but also provides a framework for anticipating and managing the implications of the evolution of AI as a communication agent in the future.

With a systematic theoretical-conceptual approach, this article is expected to make a significant contribution to the development of contemporary communication theory, while providing an academic foundation for empirical research and policy development related to AI in communication. Furthermore, this article also aims to open a broader academic discourse on how we understand and regulate the interaction between humans and AI in the context of increasingly complex and sophisticated communication.

2. Research Methods

2.1. Research Approach

This article is a theoretical-conceptual review that aims to analyze the transformation of AI roles in human communication. This approach was chosen because the phenomenon of AI as a communication agent is still in its developmental stage and requires deep conceptual understanding before it can be empirically researched (Grant & Booth, 2009; Snyder, 2019).

The method used is a narrative review that allows the analysis and synthesis of various theoretical perspectives to build a comprehensive understanding of AI-Mediated Communication (AI-MC). Unlike a systematic review, this approach provides the flexibility to integrate literature from multiple relevant disciplines (Baumeister & Leary, 1997; Ferrari, 2015). Narrative review was chosen for its ability to explore topics that are still evolving and require conceptual synthesis from multiple theoretical perspectives (Green et al., 2006).

2.2. Data Sources and Literature Search

The literature search was conducted through major academic databases that included Scopus and Web of Science for international journal articles, Google Scholar for broader coverage, IEEE Xplore and ACM Digital Library for technology publications, as well as institutional repositories and policy reports from UNESCO and EU AI documents (Fink, 2019). The search strategy used a combination of English keywords grouped in three categories: AI communication ("AI-mediated

communication", "artificial intelligence communication", "human-AI interaction"), AI agency ("AI agency", "autonomous communication", "AI decision making"), and ethics and impact ("AI ethics", "communication transparency", "AI bias").

The literature selection criteria followed the standards established for narrative reviews in communication technology research (Webster & Watson, 2002). Inclusion criteria included publications from 2015-2024 to ensure relevance to contemporary AI developments, peer-reviewed journal articles, academic books, and official policy reports, publications in English and Indonesian, and relevance to the topic of AI in communication. Exclusion criteria included articles that only discussed technical aspects of AI without communication links, non-academic publications such as blogs and mass media, and duplication or low-quality articles (Torraco, 2005).

2.3. Analysis Process

The analysis process was conducted using a thematic analysis approach that followed the framework developed by Braun & Clarke (2006) with adaptations for theoretical-conceptual studies. The analysis was conducted in three stages: reading and categorization where all the literature was read and grouped based on the main themes, thematic analysis to identify patterns and themes emerging from the literature organized under four main dimensions (evolution of communication technology from CMC to AI-MC, the concept of AI agency in communication, ethical and cultural challenges, and theoretical and practical implications), and synthesis to integrate findings from multiple sources to build a conceptual framework of Human-AI Communication (HA-C) (Thomas & Harden, 2008).

2.4. Limitations

This study has several limitations that are common in theoretical-conceptual studies (Jaakkola, 2020). These include the rapid development of AI so that some findings may become outdated, the focus on English and Indonesian publications that may overlook perspectives from other academic traditions, the interpretive nature that may be influenced by the researcher's perspective, and findings that have not been empirically tested and require further validation through experimental or survey research (Xiao & Watson, 2019). This methodological approach is designed to produce a comprehensive analysis and make a theoretical contribution to the understanding of AI transformation in human communication, while providing a foundation for future empirical research.

3. Evolution of Communication Technology: From Passive Mediators to Active Agents

3.1. Computer-Mediated Communication (CMC) Paradigm: The Era of the Passive Mediator

The development of communication technology has undergone a fundamental gradual transformation, starting from the era of Computer-Mediated Communication (CMC) which became the initial foundation of digital interaction. In the traditional CMC paradigm, technology acts as a passive mediator that facilitates the exchange of information between sender and receiver without having the ability to change, customize, or influence the content of the message conveyed (Thurlow et al., 2004; Walther, 2011). A key characteristic of CMC is the transparency of the technology, where communication tools such as email, instant messaging systems and early generation social media platforms serve as neutral channels that lack the capacity to make decisions or intervene in the communication process (Kuzminska et al., 2024; Vančová, 2023).

In the context of CMC, the control of communication is entirely in the hands of the human user. The message sender has full autonomy in determining the content, format, delivery time, and target recipients, while technology only provides the infrastructure for information transmission (Spitzberg, 2006). This communication model follows a simple linear pattern: the sender uses technology as a medium to convey the message to the receiver, with technology acting as a pipe or channel that does not affect the substance of the communication. A classic example of this paradigm can be seen in the use of email, where the system only serves to send messages that have been composed by the user without modifying, optimizing, or personalizing the content (Nurgul & Senyapar, 2024).

The limitations of the CMC paradigm become apparent when the volume of information to be processed grows and the need for personalization of communication increases. Traditional CMC technologies are unable to provide intelligent support in terms of message customization based on recipient characteristics, delivery time optimization, or assistance in effective content creation (Herring, 2007). This has led to the development of more sophisticated and adaptive communication technologies.

3.2. The Emergence of Artificial Intelligence in Communication

A significant transformation in communication technology occurred with the introduction of Artificial Intelligence (AI) elements that began to change the role of technology from a passive mediator to a more active agent. This development began with the implementation of simple automated systems such as auto-reply in email and automated answering bots in customer service, which marked the beginning of AI's involvement in the communication process (Følstad & Brandtzæg, 2020). Although

still limited, these technologies have shown the potential of AI to not only channel messages, but also generate responses autonomously (An et al., 2023).

The next evolution was marked by the emergence of machine learning algorithms capable of analyzing communication patterns and providing recommendations or assistance to users. Features such as autocorrect, quick reply suggestions, and content recommendation systems began to integrate Artificial Intelligence (AI) into everyday communication experiences (Følstad & Brandtzæg, 2020). These developments indicate a paradigm shift where technology no longer simply facilitates communication, but begins to participate in the process of crafting and optimizing messages.

Advances in natural language processing (NLP) and deep learning have dramatically accelerated this transformation. Modern AI is now able to understand the context of communication, analyze the tone and sentiment of messages, and generate contextually relevant and natural responses (Jurafsky & Martin, 2020). Technologies such as GPT, BERT, and other large language models have demonstrated AI's ability to not only understand human language, but also generate text that is difficult to distinguish from human writing.

3.3. *The AI-Mediated Communication (AI-MC) Paradigm: The Era of Active Agents*

The new paradigm emerging from this evolution is AI-Mediated Communication (AI-MC), where AI no longer acts as a passive mediator, but as an active communication agent that has the capacity to make decisions, modify messages, and even initiate communication autonomously (Hancock et al., 2020). In AI-MC, technology has a significant degree of autonomy in determining how communication is carried out, including language style adjustment, appropriate timing, and content personalization based on the recipient's profile.

A fundamental characteristic of AI-MC is the ability of AI to act as a co-communicator who actively participates in the communication process. AI in this paradigm can analyze the context of the conversation, understand the purpose of the communication, and optimize the message to achieve maximum effectiveness (Guzman & Lewis, 2020). A concrete example of AI-MC can be seen in sophisticated customer service chatbots, which not only provide pre-programmed answers, but are also able to perform situational analysis, adjust communication approaches based on customer emotions, and even make decisions about when to transfer the conversation to a human (Annamalai et al., 2023).

The fundamental difference between CMC and AI-MC lies in the distribution of communication agency. Whereas in CMC the agency rests entirely with humans, in AI-MC there is a division of agency between humans and AI, where AI has the ability to make independent communicative decisions within certain limits (Sundar, 2020). This creates a more complex communication dynamic, where the end result of an interaction is not only determined by the intentions of the human sender, but also by the interpretations and decisions made by the AI.

3.4. *Levels of Transformation in AI-MC*

The transformation from CMC to AI-MC can be understood through three levels that reflect the evolution of AI's role in communication. The first level is AI as a communication assistant, where AI provides support to human users in composing and optimizing messages. Examples of this level are the smart compose feature in Gmail that provides sentence completion suggestions, or autocorrect systems that help correct grammar and spelling errors (Liye et al., 2023). At this level, the primary control is still with the human, but AI acts as an intelligent tool that can improve the quality of communication.

The second level is AI as an autonomous communicator, where AI is able to communicate autonomously with humans or other systems without direct intervention from a human operator. Sophisticated chatbots, virtual assistants such as Siri or Alexa, and automated customer service systems are examples of this level (Følstad & Brandtzæg, 2020). AI at this level has the ability to understand questions or requests, process information, and provide relevant responses in real-time. Although AI operates autonomously, interactions are still framed within a context that has been defined by the system designer.

The third level is AI as strategic communication director, where AI not only communicates autonomously but is also able to design and direct the overall communication strategy. At this level, AI can analyze communication data on a large scale, identify patterns and trends, and provide strategic recommendations for long-term communication optimization (Russell & Norvig, 2020). An example of its application can be seen in marketing campaign management systems that use AI to determine audience segmentation, design personalized messages, and optimize timing and distribution channels based on predictive analysis.

4. AI Agent Framework In Communication

4.1. *The Concept of Agency in the Context of AI-MC*

Agency in the context of communication refers to the ability of an entity to act independently, make decisions, and influence the outcome of the communicative interaction process. In the traditional communication paradigm, agency is entirely a human domain, where individuals have full control over communicative intentions, message delivery strategies, and anticipation of expected responses. However, the emergence of AI as active communication agents has created a more

complex distribution of agency, where the ability to make communicative decisions is no longer a human monopoly (Guzman & Lewis, 2020).

AI agency in communication can be defined as the capacity of Artificial Intelligence (AI) systems to autonomously perform communicative actions that have an impact on the process and outcome of interactions. This includes the ability to interpret the context of communication, make decisions about appropriate responses, adjust the style and tone of communication based on the characteristics of the interlocutor, and anticipate and respond to evolving conversational dynamics (Fortunati & Edwards, 2020). AI agency differs from simple automation in that it involves elements of adaptability, learning, and contextualized decision-making.

The fundamental difference between human agency and AI agency lies in the source and mechanism of decision-making. Human agency is derived from subjective awareness, intentions, and experiences that enable individuals to make decisions based on complex emotional, ethical, and strategic considerations. Meanwhile, AI agency comes from machine learning algorithms that process data and patterns to generate optimal decisions based on predefined goals (Johnson & Verdicchio, 2017). Nonetheless, AI Agency can produce communicative behaviors that appear natural and responsive, creating the illusion of interaction equivalent to human-to-human communication.

4.2. Hierarchical Model of AI Agency in Communication

To understand the complexity of AI's role in communication, a hierarchical model can be developed that classifies levels of AI agency based on the level of autonomy and complexity of decisions it can make. The model consists of four tiers that reflect the evolution from simple reactive systems to highly sophisticated communication agents.

Level 1: Reactive Communication Agent is the most basic level where AI acts as an automatic responder that responds based on pre-programmed rules. At this level, the AI does not have the ability to learn or adapt from previous interactions, but can provide consistent and rapid responses to the input received (Russell & Norvig, 2020). Examples of this level of implementation are email auto-reply, simple FAQ bots, and automated notification systems. Although limited, agents at this level have demonstrated the ability to reduce the burden of human communication and provide instant responses to routine queries.

Level 2: Adaptive Communication Agent demonstrates the ability of AI to learn and adjust responses based on previous interactions and situational context analysis. Agents at this level can identify patterns in conversations, adjust communication styles based on user preferences, and optimize responses to improve communication effectiveness (Følstad & Brandtzæg, 2020). Sophisticated customer service chatbots, virtual assistants that can learn user habits, and personalized content recommendation systems are examples of this level. Agency at this level includes the ability to perform contextual reasoning and behavioral adaptation based on feedback.

Level 3: Proactive Communication Agents have the ability to initiate communication autonomously based on analysis of identified needs or situations. Agents at this level not only respond to input received, but can also anticipate communication needs and take proactive actions to facilitate interaction (Russell & Norvig, 2020). Examples of implementation are systems that automatically send project status updates to stakeholders, AI that initiates conversations to provide emotional support based on social media sentiment analysis, or virtual assistants that remind and schedule meetings based on email and calendar analysis.

Level 4: Strategic Communication Agent is the highest level where AI has the ability to design and implement complex long-term communication strategies. Agents at this level can analyze multiple stakeholders, identify multilevel communication objectives, and coordinate various communication channels to achieve set objectives (Dignum, 2019). Implementation of this level can be seen in political campaign management systems that use AI for public sentiment analysis, audience segmentation, and cross-platform message optimization, or in diplomatic AI systems that can facilitate complex negotiations by considering multiple interests and constraints.

4.3. AI Decision-Making Mechanism in Communication

The AI decision-making process in communication involves several algorithmic components that work in an integrated manner to generate appropriate and effective responses. The first component is contextual analysis, where AI analyzes various elements of the communication context including message content, participant profile, timing, communication channel, and goals to be achieved (Benotti & Blackburn, 2021). This contextual analysis enables AI to understand the communication situation holistically and identify relevant factors for decision making.

The second component is intention recognition, which is the ability of AI to identify the intention behind the received message and determine the appropriate response to the communication goal (Sarwari et al., 2024). This process involves linguistic analysis, semantic analysis, and pattern recognition to understand not only what is being said explicitly, but also the implicit meaning and underlying purpose of the communication. Intention recognition is becoming increasingly sophisticated with the use of large language models that can understand complex nuances and contexts.

The third component is response generation, where the AI generates an optimal response based on the analysis of the context and intentions that have been identified. This process involves selecting appropriate communication strategies, adjusting language registers, optimizing timing, and personalizing content based on recipient characteristics (Gao et al., 2019). Modern response generation uses techniques such as transformer architecture and generative pre-trained models to generate natural and contextually appropriate responses.

The fourth component is impact assessment and learning, which is the ability of AI to evaluate the effectiveness of the communication and use the feedback to improve future performance (Sutton & Barto, 2018). This component involves monitoring recipient responses, analyzing communication outcomes, and adjusting decision-making models for continuous optimization. This learning mechanism allows AI to continuously improve its communication skills through experience and feedback.

Figure 1 illustrates the research framework of this study, which outlines the Human-AI Communication (HA-C) model as the theoretical foundation.

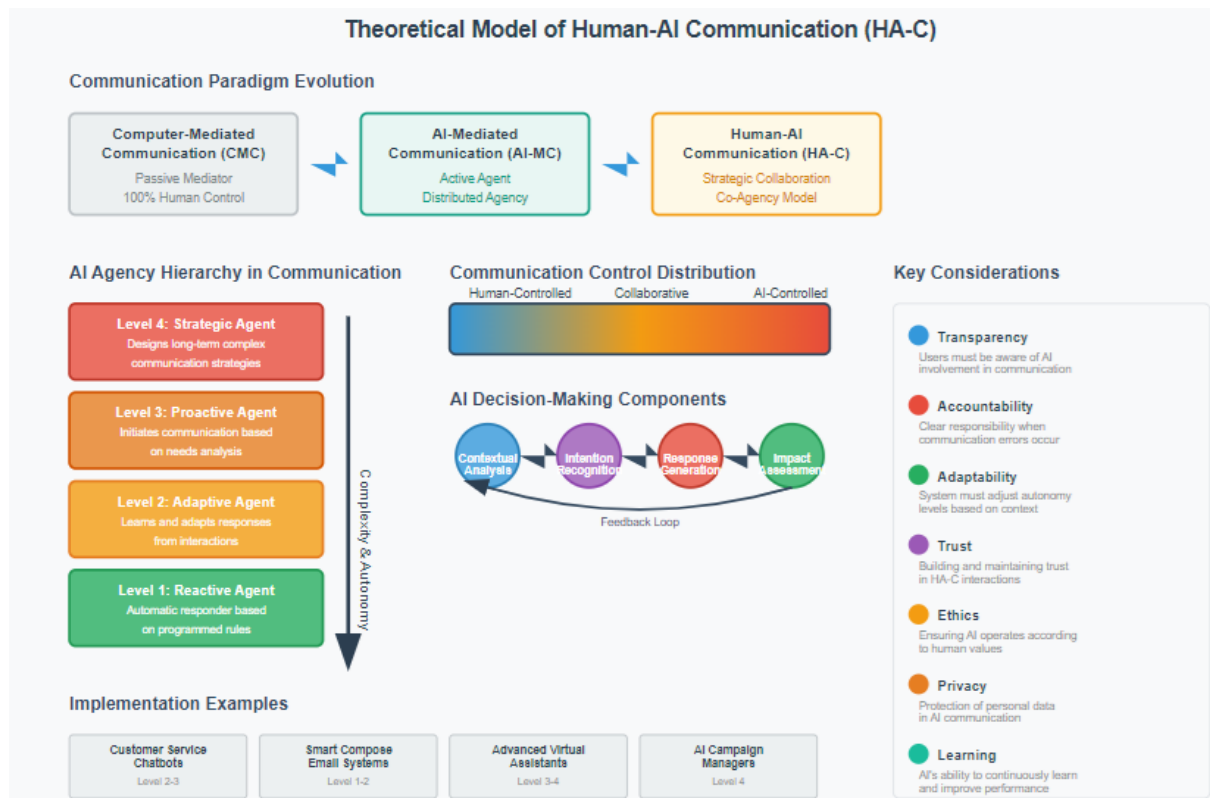


Figure 1 Human AI Communication (HA-C) Model

4.4. Distribution of Control in Human-AI Communication

In the Human-AI Communication (HA-C) paradigm, the distribution of communication control is a critical aspect that determines the dynamics of interaction and the resulting outcomes. This distribution of control can be conceptualized as a continuum spectrum that ranges from human-controlled communication to AI-controlled communication, with various gradations of collaborative control in between (Norman, 2017).

At the human-controlled communication end of the spectrum, humans maintain full control over all aspects of communication, using AI only as a tool to execute decisions that have been made. In this mode, AI acts as a sophisticated typewriter or advanced telecommunication device that has advanced processing capabilities but lacks autonomy in communicative decision-making (Shneiderman, 2020). An example of this mode is the use of AI for translation, grammar checking, or formatting, where the AI output is used as input for human decisions.

In the middle of the spectrum is collaborative communication control, where humans and AI share responsibility for communicative decision-making through various partnership mechanisms. This mode can be divided into several sub-categories: human-initiated collaboration where humans initiate communication and AI provides adaptive support, AI-augmented communication where AI provides real-time assistance and optimization, and co-creative communication where both humans and AI actively contribute to message construction and delivery (Amershi et al., 2019).

At the AI-controlled communication end of the spectrum, AI systems have full autonomy in designing, executing, and evaluating communications, with humans serving as overseers or beneficiaries of the communication outcomes. This mode



includes situations where the AI communicates autonomously with other entities (human or AI) to achieve goals set by the human, but with complete freedom in determining the communication strategy and tactics (Baum, 2020).

5. Ethical And Regulatory Challenges Of AI-MC

5.1. Transparency and Openness in AI-Mediated Communication (AI-MC)

Transparency is one of the most fundamental ethical challenges in AI-Mediated Communication (AI-MC), given AI's ability to modify, optimize, or even generate messages autonomously without the recipient's knowledge. When AI acts as an active communication agent, message recipients are often unaware of the extent of the technology's involvement in the process of composing or delivering the information they receive (Burrell, 2016; Choi, 2020). This creates information asymmetry that can affect the quality and authenticity of communicative interactions.

In the context of customer service, for example, consumers may interact with highly sophisticated AI systems without knowing that they are not communicating with a human. Research shows that when individuals learn that they are interacting with AI, their communication patterns and trust levels tend to change significantly (Luo et al., 2019). This phenomenon raises ethical questions about the right of consumers to know the nature of the communication agents they are dealing with (Esch et al., 2021).

Transparency in AI-MC is also related to algorithmic transparency, which is the openness of how AI makes decisions in the communication process. Complex machine learning algorithms often operate as "black boxes" that are difficult for even their developers to understand (Hayes et al., 2023). When AI makes decisions about how to respond to customer queries, adjust the tone of communication, or personalize messages, the decision-making process often cannot be explained in detail. This lack of explainability becomes a problem when AI decisions impact important or sensitive communication outcomes.

To address this transparency challenge, several approaches have been proposed, including the implementation of communication transparency indicators that inform users about the level of AI involvement in conversations, the development of explainable AI systems that can explain the reasoning behind communicative decisions, and the establishment of industry standards for openness in the use of AI for communication (Mathew et al., 2025). However, the implementation of these solutions faces complex technical and economic challenges, as well as the need for a balance between transparency and system effectiveness.

5.2. Accountability and Responsibility in AI-MC

The issue of accountability arises when AI-Mediated Communication (AI-MC) results in unintended consequences, misunderstandings, or even harm to the parties involved. In the traditional communication paradigm, responsibility for the content and impact of communication clearly lies with the sender of the message. However, in AI-MC, the distribution of responsibility becomes more complex as it involves multiple stakeholders: AI developers, platform providers, human operators, and the AI itself (Hohenstein & Jung, 2020).

The complexity of accountability in AI-MC can be illustrated through a scenario where a healthcare chatbot provides inaccurate medical information, which then affects the patient's treatment decision. In such cases, the question of who is responsible becomes complicated: is it the algorithm developer, the company implementing the system, the data scientist training the model, or the healthcare organization using the service? (Esmailzadeh et al., 2021).

The challenge of accountability also relates to the moral agency of AI in communication. When AI makes communicative decisions autonomously, can it be considered a moral agent that has responsibility for its actions? Most current philosophical views reject the concept of moral agency of AI, arguing that AI lacks consciousness, intentionality, or the ability to understand the moral consequences of its actions (McGraw, 2024). However, advances in increasingly sophisticated and autonomous AI are giving rise to new debates about the possibility of more nuanced forms of responsibility.

To address the challenge of accountability, various frameworks have been developed, including responsibility assignment models that distribute responsibility based on the degree of control and predictability, algorithmic auditing that enables systematic evaluation of AI performance and impact, and the development of AI insurance schemes that can provide compensation when system errors occur (Díaz-Rodríguez et al., 2023). These approaches seek to create clear accountability structures while still allowing for innovation in AI-MC technologies.

5.3. Data Privacy and Protection in AI Communication

Data privacy is a critical challenge in AI-MC because AI systems require access to large volumes of data to function effectively, including personal communication data, behavior patterns, and individual preferences. AI uses this information to personalize communications, predict user needs, and optimize interactions. However, the collection and use of this data raises serious concerns about privacy and control of personal information (Acquisti et al., 2020).

In the context of AI-MC, the data collected includes not only the explicit content of the communication, but also metadata that can reveal communication patterns, social networks, and even the emotional state of the user. AI can analyze writing style, communication frequency, response time, and various other indicators to build a highly detailed profile of an

individual. These advanced profiling capabilities enable high personalization, but also create the risk of invasive surveillance (Zuboff, 2019).

The privacy challenges in AI-MC are compounded by the nature of machine learning that requires data sharing across systems and platforms to improve performance. Communication data from one platform can be used to train AI models that are then applied on other platforms, creating a complex web of data sharing that is difficult for individual users to monitor and control. This raises questions about data sovereignty and the right of individuals to control how their personal information is used in the interconnected AI ecosystem.

Approaches to address privacy challenges include the implementation of privacy-preserving AI techniques such as federated learning that enables learning without centralized data sharing, differential privacy that adds noise to protect individual privacy, and homomorphic encryption that enables computation on encrypted data (Zhu, 2025). In addition to technical solutions, a comprehensive regulatory framework is also needed to govern the use of data in AI-MC.

5.4. Algorithmic Bias and Fairness in Communication

Algorithmic bias in AI-MC can affect the way AI systems interact with users from different demographic, cultural, and social backgrounds. AI systems are trained using historical data that often reflects biases and injustices that exist in society, and these biases can be reproduced or even reinforced in AI communication systems (Díaz-Rodríguez et al., 2023). When AI uses biased communication patterns to interact with users, it can perpetuate stereotypes and discrimination.

Bias in AI-MC can come in many forms. Representation bias occurs when training data does not fairly represent all groups in the population, for example when language models are trained primarily on text written by speakers of a particular language, gender, or socioeconomic group. Interaction bias arises when AI treats users differently based on identifiable characteristics of their communication patterns, such as accent, language style, or topics discussed (Chen et al., 2023).

In practical applications, AI-MC bias can have significant consequences. Customer service AI systems might provide different levels of service to users based on perceptions about their socioeconomic status inferred from communication styles. Recruitment chatbots might show bias towards certain candidates based on names or communication patterns associated with certain demographic groups. AI in social media platforms may promote or suppress content from certain groups based on biases in recommendation algorithms (Lee & Park, 2022).

Mitigating bias in AI-MC requires a multifaceted approach that includes diverse data collection to ensure fair representation of all groups, algorithmic fairness testing to detect and quantify bias in AI systems, inclusive design practices that involve the perspectives of various stakeholders in system development, and continuous monitoring to detect the emergence of bias in systems already in operation (Murikah et al., 2024). In addition, it is also necessary to develop fairness metrics that are appropriate to the context of communication and evaluation frameworks that can assess the impact of bias on different user groups.

5.5. AI Hallucination and Information Integrity

The phenomenon of AI hallucination, where AI systems generate information that appears convincing but is factually incorrect or has no basis in the training data, is a serious challenge in AI-MC related to information integrity and reliability. Hallucinations can occur when large language models extrapolate patterns from training data to generate responses to queries that do not have clear or accurate answers in the AI knowledge base (Ji et al., 2022).

In the context of communication, AI hallucination can result in misinformation being propagated with a high degree of confidence, making error detection difficult for lay users. AI can generate false references, fabricated statistics, or unsubstantiated factual claims, while presenting them in a format that appears authoritative and credible. This is particularly problematic in domains such as healthcare, legal consulting, or financial information, where inaccurate information can have serious consequences (Sun et al., 2024).

The hallucination challenge is compounded by AI's ability to generate highly contextualized and personalized content, which makes factual verification more difficult. AI can integrate true information with fabricated details in a seamless way, creating a coherent but partially false narrative. In customer service applications, for example, AI might provide accurate information about company policies but add incorrect procedural details or unrealistic timelines.

Strategies to address AI hallucination include knowledge grounding techniques that link response generation to verified knowledge bases, uncertainty quantification that allows AI to express confidence levels in its responses, fact-checking integration that verifies claims before presenting them to users, and human-in-the-loop verification for critical information (Massenon et al., 2025). In addition, user education is also needed to improve literacy in interacting with AI and developing a healthy skepticism towards AI-generated information.

5.6. International Regulatory Framework for AI-MC

The development of a regulatory framework for AI-MC faces complex challenges due to the rapidly evolving nature of the technology and its cross-border impact. Various jurisdictions have taken different approaches in regulating AI, creating a

fragmented and potentially inconsistent regulatory landscape. The European Union has developed a comprehensive AI Act, while the United States takes a more sector-specific approach, and other countries are still in the early development stages of their regulatory frameworks (Tallberd et al., 2024).

The European Union AI Act is one of the most comprehensive regulatory efforts for AI, categorizing AI systems based on risk levels and setting different requirements for each category. In the context of AI-MC, many AI communication applications will fall into the "high-risk" or "limited risk" category, requiring transparency obligations, human oversight, and accuracy requirements. The AI Act also specifies prohibited practices that could be relevant for AI-MC, including manipulative techniques and exploitation of vulnerabilities (European Commission, 2021; Tallberd et al., 2024).

The United States uses a more fragmented approach through executive orders and sector-specific regulations. The National Institute of Standards and Technology (NIST) has developed an AI Risk Management Framework that can be applied to AI-MC systems, while the Federal Trade Commission (FTC) uses existing consumer protection laws to regulate certain aspects of AI in communications. This approach provides flexibility but also creates uncertainty about the specific requirements for AI-MC applications (Tabassi, 2023).

Asia-Pacific countries show significant variation in AI regulatory approaches. Singapore has developed a Model AI Governance Framework that emphasizes on self-regulation and industry standards, while China implements more prescriptive regulations for specific AI applications. Japan and South Korea are developing their own frameworks with an emphasis on innovation-friendly regulation (Chng, 2025).

Indonesia is still in the early development stage of a comprehensive AI regulatory framework. While some existing regulations such as the ITE Law and regulations on data protection can be applied to certain aspects of AI-MC, there is no framework specifically designed to address the unique challenges of AI in communications. The development of AI regulations in Indonesia needs to consider the local context while aligning with international standards and best practices (Revolusi & Febriandy, 2025).

5.7. Cross-Border Challenges and Regulatory Harmonization

AI-MC systems often operate across multiple jurisdictions, creating complex challenges in terms of applicable laws and regulatory compliance. AI-enabled global communication platforms may serve users from different countries with different regulatory frameworks, raising questions about which laws apply and how compliance can be ensured. This is compounded by the fact that AI processing can take place on cloud servers that are located in countries different from the location of the user or the company providing the service (Zaidan & Ibrahim, 2024).

Harmonization of AI-MC regulations requires extensive international cooperation and the development of common standards that can be adopted across jurisdictions. Organizations such as OECD, UNESCO, and ISO have developed principles and standards for AI that can provide a foundation for harmonization, but the translation from high-level principles to specific regulatory requirements for AI-MC still requires significant work (Erdélyi & Goldsmith, 2022).

Additional challenges arise from different cultural values and social norms that influence perceptions of acceptable AI behavior in communication. What constitutes appropriate AI transparency, privacy protection, or bias mitigation can vary significantly across cultures and legal traditions. Effective global governance for AI-MC must be able to accommodate this diversity while still providing sufficient protection and consistency for cross-border operations (Papagiannidis et al., 2025).

Future development of international governance for AI-MC will likely require a combination of binding international agreements, soft law instruments, industry standards, and multi-stakeholder governance mechanisms. Platform companies, AI developers, civil society organizations, and governments need to collaborate in developing approaches that can balance innovation with the protection of fundamental rights and values in an increasingly AI-mediated global communication ecosystem.

6. Implications for Control and Transparency in Communication

With AI playing an increasingly active role in communication, questions of control and transparency become critical. When AI has the capacity to modify or generate messages, who is actually responsible for the content of the communication? For example, if an AI-generated message leads to a misunderstanding, does the responsibility lie entirely with the (human) user of the AI, or the AI itself as a communication agent?

Rezwana & Maher (2022) state that since AI has the ability to adapt and learn contextually, it can be considered a co-active communicator, which means it has partial responsibility for the outcome of the interaction. However, this concept poses an ethical dilemma, especially when the user is unaware that the message received has been mediated or modified by the AI.

Transparency becomes a critical issue here. Message recipients may not be able to distinguish whether a message was generated by a human or an AI, and this may affect their perception of the honesty and authenticity of the message. In political campaigns, for example, AI can be used to customize messages based on voters' psychological profiles, which in turn can influence voters' decisions unconsciously (Guzman & Lewis, 2020). This poses a major challenge in maintaining the

transparency of AI-generated communications, especially when AI has the capacity to modify content according to specific purposes.

6.1. Perception and Trust in AI-Mediated Communication (AI-MC)

One of the most fundamental aspects that changes with the presence of AI is how perception and trust are formed in communication. In conventional communication, trust is built based on the authenticity of the message and the credibility of the sender. However, in the context of AI-Mediated Communication (AI-MC), message recipients are often unaware that AI plays an active role in the communication process. Studies by (Guzman & Lewis, 2020) show that when message recipients learn that a message has been generated or modified by AI, their level of trust in the message tends to decrease, even though the message remains relevant and accurate.

This phenomenon poses a challenge in maintaining the authenticity of communication. When AI can modify words to make a message sound more polite, more empathetic, or more persuasive, message recipients may feel that the communication does not fully reflect the original intentions of the human sender. Lee & Park (2022) call this phenomenon the "communication alienation effect," where the receiver of the message feels alienated because they cannot identify the real actor behind the message.

The implications of this change in perception are very real in the context of customer service and marketing. For example, in interactions between consumers and chatbots, research shows that consumers tend to be more skeptical of responses that are perceived as too "programmed" or inhuman. This indicates that AI not only needs to design logical responses, but should also consider emotional factors and social context that influence how messages are received (Cohn et al., 2021).

6.2. Self-Presentation and Self-Identity: Changes in the Way Humans Present Themselves

AI is also affecting the way humans present themselves in communication. Previously, self-identity in digital communication was shaped entirely by how one chose to disclose personal information and interact with others. However, with AI that can provide response suggestions or even generate personalized content, one's digital identity can be shaped and influenced by AI algorithms (Kumar et al., 2019). For example, AI in online dating apps can provide profile suggestions that enhance the user's attractiveness, or AI algorithms in social media can suggest content that aligns with the self-image that the user wants to build.

The implications of these changes are complex. On the one hand, AI can help individuals present the best version of themselves, but on the other hand, it can also create inauthenticity in digital identity. When AI actively regulates the way one interacts and presents oneself, the authenticity of identity becomes blurred, and individuals may feel pressured to maintain the image created by the AI (Shufang, 2021).

6.3. Cultural Homogenization and Global Dynamics

One other aspect that needs to be considered is the impact of AI on cultural homogenization in communication. When AI is used to customize messages based on global communication patterns, it tends to promote homogeneous communication norms and ignore the richness of cultural variations (Sarwari et al., 2024). For example, AI used in global marketing campaigns may use a more universal communication style, which may ultimately reduce the uniqueness and characteristics of local cultures. (Zdravkova et al., 2022) noted that AIs designed to interact in multicultural environments often adopt a "neutral" communication style to avoid misunderstandings, but this can also remove cultural distinctiveness that should be retained.

6.4. Hallucinations in AI-Mediated Communication (AI-MC)

Alongside the positive potential offered by AI as an active communication agent comes a significant challenge in the form of the "AI hallucination" phenomenon. The term hallucination in Artificial Intelligence (AI) refers to a situation where AI generates information that sounds convincing but is actually incorrect or has no clear factual basis. This phenomenon is mainly found in large language models (LLMs), such as ChatGPT, which sometimes generate false information spontaneously (Ji et al., 2022).

For example, a recent study found that about 27% to 46% of AI-generated text output had factual errors or even contained completely fabricated information. In fact, some instances have shown AI to be capable of creating references or citations that never existed in reality, yet still appear scientifically or academically convincing (Metz, 2023).

A key challenge of AI hallucination is the potential for widespread dissemination of misinformation, especially in academic, political, or business communication contexts where accuracy is critical. In business communication, for example, misinformation generated by AI can damage brand reputation or reduce consumer trust (Newman & Gopalkrishnan, 2023). Therefore, specialized mitigation strategies are needed to deal with this risk, such as external information validation or hybrid approaches that combine human and AI decisions (Ji et al., 2022; Newman & Gopalkrishnan, 2023).

7. Conclusions

The transformation of communication technology from the era of Computer-Mediated Communication (CMC) to AI-Mediated Communication (AI-MC) represents a fundamental paradigmatic change in human communication. This article has explored the evolution of the role of Artificial Intelligence (AI) from a passive communication tool to an active communication agent capable of making decisions and influencing interaction outcomes autonomously. Through the development of the Human-AI Communication (HA-C) theoretical framework, this research makes a significant contribution to the understanding of communication transformation in the digital era.

This research produces three key theoretical contributions. First, the four-level hierarchical model of AI agency—from reactive agent to strategic agent—provides a systematic framework for understanding different levels of AI autonomy in communication. Second, the concept of distributed agency challenges the traditional assumption that communication agency is the exclusive domain of humans, suggesting that modern communication involves complex collaborations between humans and AI. Third, the identification of AI decision-making mechanisms consisting of context analysis, intention recognition, response generation, and evaluation with continuous learning.

AI-MC adoption presents complex ethical challenges including transparency, accountability, data privacy, algorithmic bias, and AI hallucination phenomena. Analysis of the international regulatory landscape shows significant fragmentation in approaches to governance, with the European Union developing a comprehensive framework through the AI Act, while many countries including Indonesia are still in the early stages of developing specific regulations for AI in communications.

The research findings have important practical implications for organizations in optimizing communications, for policymakers in developing a balanced regulatory framework, and for researchers in future research agendas. The proposed vision leads to the development of a symbiotic relationship between humans and AI in communication, where AI amplifies human capabilities without replacing fundamental elements such as empathy and authenticity.

As a theoretical-conceptual study, this research has limitations that require further empirical validation. The transformation towards AI-MC represents more than just technological evolution—it reflects a fundamental shift in the way humans interact with technology and each other. Successful implementation of AI-MC will depend on the ability to design systems that strengthen human communication capabilities while maintaining core values such as authenticity, empathy, and genuine connection.

The Human-AI Communication Framework developed provides a foundation for understanding and navigating this transformation, but ongoing research, thoughtful policy development, and a commitment to human-centered design will remain essential to realizing the potential benefits of AI-MC while mitigating risks and maintaining fundamental human values in communication. Ultimately, the evolution towards AI-MC represents an opportunity to enhance human communication capabilities and facilitate better understanding across diverse communities and cultures.

Ethical considerations

Not applicable.

Conflict of Interest

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