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The Analysis of Embedded AI Shapes Everyday Smartphone Media Practices

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Abstract. With the widespread integration of artificial intelligence (AI) into smartphone systems and platforms, AI has become an increasingly invisible yet influential component of everyday media use. Rather than being experienced as explicit technological features, many AI systems are embedded in the background of smartphone interfaces through automated decision making, default settings, and algorithmic recommendations. This paper examines how embedded AI shapes everyday smartphone media practices from the perspective of media and communication studies. Adopting a literature review and theoretical analysis method, the study explores key forms of embedded AI in smartphones, including predictive input, algorithmic content recommendation, and system-level intelligent prompts. It further analyzes how these invisible systems influence users' operational paths, media habits, and perceptions of control. The paper concludes that embedded AI functions as a form of algorithmic mediation that indirectly restructures user experience while also raising concerns related to visibility, trust, and user autonomy. By focusing on the everyday and often unnoticed dimensions of AI, this study contributes to a deeper understanding of media practices in the age of artificial intelligence.

Keywords: Embedded AI, Smartphone Media Practices, Algorithmic Mediation, User Perception

1. Introduction

Artificial intelligence has rapidly become an integral component of contemporary smartphone systems and digital platforms. From predictive text and personalized content feeds to system-level reminders and automated suggestions, AI increasingly operates in the background of everyday mobile media use. Unlike earlier technologies that were clearly perceived as tools activated by users, many AI-driven functions are seamlessly embedded into smartphone interfaces, functioning through automated processes that rely on user data. As a result, users often do not consciously engage with AI, yet their information exposure, interaction patterns, and decision-making processes are continuously shaped by algorithmic systems. This highlights a central tension in the current media environment: while AI is widely described as becoming more intelligent and powerful, it is at the same time becoming less visible in everyday media practices [1].

Existing research has examined the growing role of algorithms and AI in shaping media environments, particularly in areas such as algorithmic recommendation, platform governance, and

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human-AI interaction [2,3]. Studies show that algorithmic systems mediate users' access to information and structure communication patterns, often without explicit user awareness [4]. Scholars have raised concerns about algorithmic opacity, limited transparency, and trust, emphasizing how restricted visibility into AI decision-making can affect users' sense of control and acceptance [5,6]. However, most studies focus on platform-level algorithms, such as social media recommendation systems, while comparatively less attention has been paid to AI embedded at the system level of smartphones and its influence on everyday media practices [1].

To address this gap, this study adopts a literature review and theoretical analysis approach to explore how embedded AI shapes everyday smartphone media practices. Focusing on common yet often unnoticed functions, the paper analyzes how embedded AI influences user behavior, perception, and trust. By situating embedded AI within the framework of media and communication studies, this research contributes to discussions on algorithmic mediation and media invisibility, and offers insights into the evolving relationship between users and intelligent systems, highlighting the broader implications of embedded AI for understanding contemporary media practices.

2. Literature review

2.1. Invisible and embedded technologies

The concept of invisible or embedded technology has long been discussed in studies of ubiquitous and pervasive computing. Early research emphasized that advanced technologies tend to fade from users' conscious awareness once they become seamlessly integrated into everyday environments. Rather than drawing attention to themselves, such technologies operate in the background, shaping user behavior through default settings, automation, and contextual responsiveness [1]. In this sense, technological invisibility does not imply a lack of influence; instead, it often signals a deeper level of integration into daily practices.

Recent studies have extended this perspective to artificial intelligence, arguing that AI systems increasingly function as embedded infrastructures rather than separate tools [4]. In everyday contexts such as smartphone use, processes driven by AI are rarely experienced as explicit interactions. Features such as predictive text, automatic photo categorization, or recommendations at the system level are generally perceived as natural components of the interface, illustrating how AI becomes normalized through seamless integration [1,4]. Recent research on on-device AI applications further demonstrates how such features become embedded in routine smartphone practices [3].

Scholars have noted that the invisibility of embedded technologies can lead to their normalization within everyday practices [4]. As users adapt to interfaces supported by AI, algorithmic decisions become taken for granted, reducing opportunities for reflection or critical awareness. From a media studies perspective, this normalization is significant because it shifts attention away from technological agency while allowing embedded systems to exert sustained influence over interaction patterns and decision-making processes [2]. Thus, the study of embedded AI requires not only technical analysis but also an examination of how invisibility itself functions as a mediating condition.

2.2. Algorithmic mediation in everyday media practices

Within media and communication studies, the concept of algorithmic mediation describes how algorithms structure the flow of information, interaction, and visibility in digital environments [2].

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Rather than acting as neutral intermediaries, algorithms actively participate in shaping what users see, how they engage with content, and which options are presented as relevant or preferable [2]. This mediating role is particularly clear in platform-based environments such as social media, search engines, and content-sharing applications.

More recent research suggests that algorithmic mediation extends beyond platforms into the system-level infrastructures of everyday devices, especially smartphones [4]. Embedded AI systems influence media practices by organizing content feeds, prioritizing notifications, and guiding user actions through predictive and adaptive mechanisms. These processes subtly structure users' operational paths, encouraging certain behaviors while discouraging others. As a result, everyday media practices are increasingly produced jointly by users and algorithmic systems [2,4].

Importantly, algorithmic mediation often operates without explicit user awareness. Studies have shown that users frequently underestimate or misunderstand the extent to which algorithms shape their media environments [3]. This limited awareness is partly related to design choices that prioritize convenience and efficiency in human-AI interaction [7]. From this perspective, embedded AI functions as a subtle form of governance, influencing user behavior through suggestion and automation rather than direct instruction.

2.3. Ethics, trust, and the visibility of AI systems

The growing invisibility of AI systems has raised important ethical questions, particularly regarding transparency, trust, and user autonomy [2,4]. Research in human-AI interaction has highlighted that users' trust in AI systems is closely linked to their understanding of how these systems operate and make decisions [5]. Foundational design guidelines for human-AI interaction further emphasize the importance of transparency, feedback, and clear communication of system capabilities in fostering appropriate trust and user control [7]. When AI-driven processes remain unclear, users may experience a reduced sense of control, even if the systems provide functional benefits [6].

Studies on explainable AI argue that greater transparency can enhance user trust by making algorithmic decision-making more interpretable [8,9]. However, in the context of embedded AI, full transparency is often difficult to achieve. System-level AI functions are deeply integrated into operating systems and interfaces, making their operations less accessible to user scrutiny [4]. As a result, users may depend on outcomes produced by AI without fully understanding the logic behind them.

Trust and privacy concerns further complicate user evaluations of embedded AI. Users' trust is often built through repeated interactions emphasizing convenience and accuracy, yet moments of misalignment can disrupt trust and expose the otherwise invisible AI presence [5,10]. Ethical AI design should prioritize user agency, accountability, and meaningful control, even within deeply embedded systems [7,9,10]. The existing literature highlights a central tension in the design and experience of embedded AI: invisibility enhances seamless interaction but can obscure agency, responsibility, and ethical implications [2,4].

3. Case analysis

3.1. Forms of embedded AI in smartphones

Embedded AI is widely present in contemporary smartphones, often operating as an invisible infrastructure that supports everyday media use. One prominent form is predictive text and smart input systems, which analyze typing patterns, frequently used phrases, and contextual information to

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generate word suggestions or complete sentences automatically. For example, typing "On my way" may trigger "be there in 10 minutes," and smart replies suggest contextually appropriate responses such as "Sounds good" or "Thank you." Users rarely perceive these features as autonomous AI agents, understanding them as a natural extension of the keyboard. Over time, users may adapt their language to align with algorithmic suggestions, subtly reshaping communication practices.

Algorithmic content recommendation is another key form. Smartphones curate news feeds, video suggestions, music playlists, shopping prompts, and social media timelines based on user behavior. For example, after watching videos on a topic, similar content may dominate the feed. Users often perceive the feed as reflecting personal preference, without recognizing the continuous filtering and ranking behind the interface.

System-level reminders and operational suggestions further exemplify embedded AI. Features like notification prioritization, battery optimization alerts, and contextual reminders rely on prediction and analysis. Suggestions such as leaving earlier for an appointment or responding to a message shape attention and behavior, illustrating how AI structures temporal routines and daily rhythms.

3.2. The influences of embedded AI on user practices

Embedded AI shapes everyday smartphone media practices by structuring users' operational paths and interaction routines. Predictive input systems encourage users to select suggested words rather than composing messages independently. Over time, this small shortcut can influence linguistic habits and conversational tone. For example, users may increasingly rely on short, standardized responses generated by smart reply systems, which may reduce diversity in casual communication.

Algorithmic recommendations guide users toward certain content, reducing the need for active searching while narrowing exposure to prioritized information. Users often scroll through feeds curated by algorithms, where content appears automatically. This shift from active search to passive reception represents a transformation in media practice: the smartphone interface becomes a dynamic environment structured by predictive logic, with attention flowing along paths predetermined by recommendation systems.

These mechanisms foster habitual interaction patterns. Users may open apps at specific times because notifications are delivered when engagement likelihood is high. Embedded AI stabilizes media practices through automation and repetition. The convenience of AI-driven systems encourages acceptance of algorithmic guidance, reinforcing reliance on predictive and adaptive functions.

Embedded AI also reshapes decision-making by embedding choices within predefined options. Suggested actions like "Reply now," "Share this memory," or "Continue watching," and automatic adjustments such as brightness adaptation or auto-play, subtly nudge behavior. This form of mediation does not eliminate agency but reframes it: users still make decisions, yet these occur within algorithmically structured environments, highlighting AI as a co-actor in everyday practices.

3.3. User perception, acceptance, and privacy concerns

Despite its pervasive influence, embedded AI often remains below the threshold of user awareness [3]. Many users struggle to identify which smartphone functionalities are AI-driven and which are purely mechanical features. For example, predictive photo organization, in which images are automatically grouped by faces, locations, or events, may be perceived as a simple sorting function rather than the result of machine learning algorithms. This limited perception contributes to

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widespread acceptance, particularly when effects are associated with convenience and personalization.

Acceptance varies across forms of embedded AI. Predictive input is generally seen as helpful and non-intrusive because it operates within a clearly bounded task: typing. In contrast, algorithmic recommendations and behavioral predictions may raise concerns about data collection and surveillance. Users sometimes express discomfort when advertisements reflect recent offline conversations or browsing activities, even if personalization improves relevance.

Trust is closely linked to perceived control and understanding. Positive repeated interactions, such as accurate recommendations or timely reminders, build practical trust. However, moments of misalignment can expose the invisible AI presence. When recommendation feeds become repetitive, biased, or inappropriate, users may recognize the algorithmic filtering and question reliability [3,10]. Similarly, incorrect predictive suggestions can disrupt seamless integration.

Privacy adds further complexity. Embedded AI often relies on continuous behavioral data collection, including location, communication patterns, and browsing history. While such data enable personalization, they create asymmetries of knowledge between users and providers. Users rarely have full visibility into data processing or predictive model operations [6,8]. As a result, embedded AI exists in a delicate balance: unnoticed when functioning smoothly, yet highly visible during errors or ethical concerns.

Overall, embedded AI shapes everyday smartphone media practices through subtle, persistent forms of mediation, influencing routines, decision-making, and perceptions, making it an integral yet often unacknowledged component of contemporary media life.

4. Discussion

4.1. Embedded AI, invisibility, and reconfigured agency

Embedded AI in smartphones primarily exerts influence through its invisibility. Users often interact with predictive text, personalized recommendations, or system-level reminders without consciously recognizing their AI-driven nature. Its effectiveness relies on seamless integration that minimizes cognitive friction and reflection. Algorithmic power is exercised subtly, shaping default options, interaction sequences, and temporal rhythms of use, thereby reinforcing habitual media practices without explicit user awareness [1]. For example, content feeds are reordered automatically, and notification priorities are set by contextual predictions, gradually guiding attention and decision-making while remaining largely invisible in daily routines.

At the same time, embedded AI does not remove user agency but reconfigures it. Predictive input systems, recommendation engines, and contextual reminders influence the range of actions users take by prioritizing certain behaviors. Agency emerges in the dynamic interaction between human intention and technological functionalities. For instance, users may accept suggested words or follow recommended content paths because the convenience reduces effort, yet they retain the option to override defaults. This mediated agency highlights how AI co-produces everyday practices: automation structures choices while preserving user discretion [4].

4.2. Implications for algorithmic literacy and media awareness

The subtlety of embedded AI challenges traditional transparency approaches. Developing algorithmic literacy requires practice-oriented strategies, contextual cues, and interface designs that improve understanding without disrupting usability. As a central mediator of contemporary media

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practices, embedded AI shapes access, interpretation, and engagement, emphasizing the need for users to recognize its invisible role in structuring everyday digital experiences [3]. Promoting awareness can empower users to exercise informed choices while benefiting from convenience, bridging the gap between seamless interaction and conscious understanding.

5. Conclusion

This study aimed to investigate how embedded AI shapes everyday smartphone media practices and how users perceive, accept, and respond to its presence. The analysis indicates that embedded AI operates primarily through invisibility, influencing operational paths, interaction routines, and decision-making without explicit user awareness. Predictive input, algorithmic recommendations, and system-level intelligent prompts collectively structure user behavior, reinforcing habitual practices while subtly reconfiguring agency. Users generally appreciate the convenience and efficiency offered by these systems, but their acceptance is tempered by concerns about trust, control, and privacy, illustrating the complex interplay between visibility, usability, and ethical considerations.

The research contributes to the existing body of knowledge by highlighting the role of embedded AI as a form of algorithmic mediation that extends beyond platform-level algorithms into the intimate, everyday environment of smartphones. By emphasizing the invisible and infrastructural nature of these systems, this study expands theoretical understanding of media practices in the age of artificial intelligence and provides empirical grounding for discussions on user trust, autonomy, and algorithmic influence.

Practically, the findings underscore the importance of fostering algorithmic literacy and designing interfaces that balance seamless functionality with opportunities for user awareness and control. Users' perceptions and acceptance of embedded AI are shaped not only by technical performance but also by design choices that affect visibility and perceived agency.

This study is limited by its reliance on literature-based analysis rather than large-scale empirical testing, which may affect the generalizability of the findings. Future research could incorporate cross-cultural comparisons, user experience studies, and experimental designs to further investigate how embedded AI mediates media practices across diverse populations. Overall, this study provides new insights into the pervasive yet often unnoticed influence of AI on everyday smartphone use and highlights the importance of understanding algorithmic mediation as a central feature of contemporary media environments.

References

[1] Huang, X., Wang, H., Qin, S., & Tang, S.K. (2025). Embedded Artificial Intelligence: A Comprehensive Literature Review. Electronics, 14(17), 3468. https: //doi.org/10.3390/electronics14173468

[2] Jung, J., & Kim, J. (2025). Rethinking media users in the age of AI and algorithmic mediation. Media and Communication, 13, Article 10915. https: //doi.org/10.17645/mac.10915

[3] Siu, J. C. Y., Chen, J., Huang, Y., Xing, Z., & Chen, C. (2023). Towards real smart apps: Investigating humanAI interactions in smartphone ondevice AI apps (Preprint). arXiv.

[4] Riva, G. (2025). Invisible architectures of thought: Toward a new science of AI as cognitive infrastructure (Preprint). arXiv.

[5] Na, Y., Liu, Y., & Lai, K. (2025). Can the public accept AIgenerated health news? Experimental evidence from trust mediation and negative expectancy violation moderation. Journal of Psychological Science, 48(4), 972–984.

[6] Ahn, D., Almaatouq, A., Gulabani, M., & Hosanagar, K. (2021). Will we trust what we don't understand? Impact of model interpretability and outcome feedback on trust in AI. arXiv.

DOI: 10.54254/2755-2721/2026.AD32485

[7] Amershi, S., Weld, D., Vorvoreanu, M., Fourney, A., Nushi, B., Collisson, P., … & Horvitz, E. (2019). Guidelines for humanAI interaction. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (pp. 1–13). ACM. https: //doi.org/10.1145/3290605.3300233
[8] Shin, D. (2021). The effects of explainability and causability on perception, trust, and acceptance: Implications for explainable AI. International Journal of HumanComputer Studies, 146, Article 102551. https: //doi.org/10.1016/j.ijhcs.2020.102551
[9] T. Jiang (2024). HumanAI interaction research agenda: A usercentered perspective. HumanAI Interaction journal.
[10] Ruckenstein, M. (2023). The Feel of Algorithms (Book). University of California Press.