

BOOK REVIEW

Toward Cognitive Computational Advertising—A Review of Computational Advertising: Evolution, Transformation, and the Cognitive Turn

Zhibin Jiang¹ | Xin Gao²

¹Professor, Shanghai International Studies University, Shanghai, China

²PhD candidate, South China University of Technology, Guangzhou, China

Correspondence

Corresponding author Xin Gao.
Email: gx513471836@gmail.com

Abstract

This review examines *Computational Advertising: Evolution, Transformation, and the Cognitive Turn* (in Chinese 计算广告的发展、流变与认知转向), edited by Duan Chunlin and published in 2025, and assesses its attempt to reposition computational advertising through a cognitive orientation that foregrounds human-machine collaboration, semantic understanding, and mechanism-based explanation. The book traces the evolution from programmatic delivery to cognitive computational advertising and articulates how data infrastructures, platform mechanisms, and generative AI are jointly reshaping creative production, distribution coordination, and effect measurement. It further proposes conceptual and methodological pathways—most notably the TKLI framework—as an alternative to linear knowledge hierarchies, arguing for closed-loop processes of semantic interaction, knowledge collaboration, and reasoning-based decision-making. This review highlights the book's contributions to clarifying disciplinary boundaries and advancing a research agenda that moves beyond correlation-focused optimisation toward cumulative explanatory models. It also identifies areas where the argument could be strengthened, including clearer specification of key constructs, more explicit empirical validation strategies, and tighter discussion of governance implications under privacy, bias, and cross-cultural constraints. The review concludes by highlighting how the book's cognitive turn provides a coherent agenda for future work on advertising communication mechanisms, methodological renewal, and the theory-practice interface in intelligent communication.

KEYWORDS

Computational advertising; Cognitive computational advertising; Generative artificial intelligence; Intelligent agents; Fifth paradigm.

As digital media infrastructures become increasingly automated and AI-enabled, the paradigms and technological pathways of advertising communication are being fundamentally reshaped (Zhang and Gao 2025). The shift from computational advertising grounded in programmatic delivery to cognitive computational advertising that foregrounds human-machine collaborative decision making and semantic understanding reflects a dual transformation of the media environment and the

broader cognitive conditions of communication. This conceptual transition aligns with broader developments in computational marketing and AI research (Wei 2024), which emphasize interpretability, transparency, and cognitive modeling in advertising content analysis (Barari and Eisend 2024, Akter et al. 2022). It is within this structural tension that *Computational Advertising: Evolution, Transformation, and the Cognitive Turn* situates its argument. Rather than offering a linear narrative of technological replacement, the book seeks to reorganize the industrial practices, communicative mechanisms, and disciplinary knowledge of computational advertising, treating the cognitive turn as a unifying interpretive lens. In doing so, it provides an integrative conceptual framework that links theoretical grounding with practical reference

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points for research in intelligent communication and industry innovation (Huh and Malthouse 2020).

Structured around the trajectory from computational advertising to cognitive computational advertising, the book is organized into three parts (Parts I–III), progressing from developmental evolution to technological application and, finally, to cognitive transformation. This tripartite structure establishes a research logic that moves from macro-level trends to micro-level mechanisms, before returning to higher-level paradigmatic and methodological questions. Such an arrangement enables readers to grasp three interrelated dimensions: first, how computational advertising has become embedded in contemporary communication systems through data infrastructures and platform mechanisms; second, how generative AI and intelligent agents are reshaping the logics of programmatic creativity, distribution coordination, and effect measurement; and third, how the incorporation of cognitive science pushes advertising research beyond correlation-focused optimization toward mechanism-oriented explanation, thereby laying the groundwork for subsequent theoretical development and algorithmic governance frameworks. Part I focuses on the development and evolution of computational advertising (Chapters 1 and 2). Beginning with the conditions of emergence and the developmental trajectory of computational advertising, the authors revisit the structural transition from contract-based advertising and targeted advertising to programmatic buying, highlighting how data, models, and algorithms jointly reconstruct advertising communication mechanisms. Advertising is no longer merely a matter of media resource purchasing and scheduling; instead, it increasingly operates as a continuously running system of algorithmic decision-making within platform economies through automated transactions and real-time optimization. Within this framework, the book traces the transformation of advertising strategies driven by big data, examining the internal logic of data management platforms, user tagging systems, interest-matching algorithms, and intelligent decision mechanisms. This analysis captures a shift in emphasis from advertisers purchasing exposure to systems automatically identifying and prioritizing users within the digital advertising ecosystem. Importantly, Part I does not reduce computational advertising to more precise targeting. By integrating intelligent creativity and content optimization into the communication mechanism, it clarifies the theoretical foundations and technical support underlying the integration of brand building and performance, while also outlining emerging trends such as the systematization of creativity, intelligent transactions, and multi-screen integrated communication (Duan and Cui 2024).

Part II concentrates on the technological application of computational advertising (Chapters 3, 4, and 5). This part centers on the implementation logic of cognitive computational advertising and examines a deeper shift from computational precision to cognitive understanding. The authors argue that with the entry of generative AI and intelligent agents into advertising systems, content production is moving from material assembly and rule-based scheduling toward dynamic generation and knowledge recombination. This transformation parallels new findings in platform governance and the ethical implication of the crowd

in value creation (Lissillour and Sahut 2022, Sahut et al. 2023). At the same time, the book addresses key industrial constraints—including data bias, privacy protection, computational capacity limitations, and cross-cultural adaptation—treating them as boundary conditions that cognitive computational advertising must navigate. This discussion reflects a dual concern for technical feasibility and sustainable governance, resonating with recent inquiries into power dynamics and ethical transparency in AI implementation strategies (Lissillour and Monod 2024).

Part III foregrounds a research paradigm shift grounded in cognitive science (Chapters 6 and 7). Here, the analytical focus moves toward theoretical consolidation and methodological refinement. The authors construct a modeling framework that integrates large language models with knowledge-collaboration mechanisms, proposing a multi-layer research structure and bidirectional coordination approach that emphasizes the coupling of models, knowledge, reasoning, and decision-making. This approach anticipates the emerging management perspective that recognizes AI–human interaction as a dynamic system of ethical supervision and cognitive augmentation (Monod 2025, Singla 2024). Moreover, by examining intelligent agent-driven content generation and advertising creativity, the book explores how cognitive dynamics, psychological mapping, and affective interaction unfold within communication scenarios, addressing how understanding emerges, resonance is produced, and relationships are systematically shaped. In doing so, it shows how cognitive computational advertising can enable practice paradigms centered on value co-creation and system coordination.

From a paradigmatic perspective, cognitive computational advertising corresponds closely to what is often described as a “fifth paradigm,” namely a research logic oriented toward AI-enabled knowledge generation and knowledge collaboration. Rather than approximating truth primarily through empirical induction or single-model data fitting, it integrates multi-source intelligent agents and cognitive reasoning through knowledge-generation mechanisms into an iterative, learning-oriented knowledge process. This reflects an epistemic shift where computational advertising contributes to the broader management discourse on sustainable innovation and organisational learning (Duan and Cui 2024). The significance of this approach lies in how it repositions cognitive computational advertising: no longer as a problem of technological accumulation, but as a systemic question of how knowledge structures are generated, coordinated, and rendered interpretable.

Although the book presents a well-organized and insightful perspective on the evolution of computational advertising, its discussion remains largely theoretical, with relatively limited empirical evidence illustrating how cognitive mechanisms function in practice. The analysis of algorithmic governance could be further developed to address transparency, fairness, and accountability in cognitive advertising systems. In addition, as the argument is grounded mainly in China’s digital ecosystem, its applicability to other cultural and market contexts warrants further examination.

AUTHOR CONTRIBUTIONS

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CONFLICT OF INTEREST

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REFERENCES

- Akter, S., Bandara, R., Hani, U., Wamba, S.F., Foropon, C. & Papadopoulos, T. (2022) Algorithmic bias in machine learning-based marketing: A synthesis and research agenda. *Journal of Business Research*, 144, 201–216. doi:10.1016/j.jbusres.2022.01.083. URL <https://doi.org/10.1016/j.jbusres.2022.01.083>
- Barari, M. & Eisend, M. (2024) Computational content analysis in advertising research. *Journal of Advertising*, 53(4), 681–699. doi:10.1080/00913367.2024.2407642. URL <https://doi.org/10.1080/00913367.2024.2407642>
- Duan, C. & Cui, Y. (2024) Influence of computational advertising discipline development on sustainable innovation capability: An analysis of the chain mediating effects of organizational learning and knowledge sharing. *Modern Communication (Journal of Communication University of China)*, (3), 139–147. doi:10.19977/j.cnki.xdcb.2024.03.012. URL <https://doi.org/10.19977/j.cnki.xdcb.2024.03.012>
- Huh, J. & Malthouse, E.C. (2020) Advancing computational advertising: Conceptualization of the field and future directions. *Journal of Advertising*, 49(4), 367–376. doi:10.1080/00913367.2020.1795759. URL <https://doi.org/10.1080/00913367.2020.1795759>
- Lissillour, R. & Monod, E. (2024) The illusion of transparency: Examining power dynamics in AI implementation strategies. *Revue internationale de psychosociologie et de gestion des comportements organisationnels*, 30(80), 79–114. doi:10.3917/rips1.080.0079. URL <https://doi.org/10.3917/rips1.080.0079>
- Lissillour, R. & Sahut, J.M. (2022) How can platforms expand their collaboration with external developers seeking legitimacy? *Management & Prospective*, 39(5), 109–155. doi:10.3917/g2000.395.0109. URL <https://doi.org/10.3917/g2000.395.0109>
- Monod, E. (2025) AI-Human interaction: Insights from organizational behavior and AI ethics in AI supervision. *Management Research Quarterly*, 2(1), 41–49. doi:10.63029/rqg5z883. URL <https://doi.org/10.63029/rqg5z883>
- Sahut, J.M., Braune, É. & Lissillour, R. (2023) A problematization of artificial intelligence ethics: Deliberative democracy versus agonistic pluralism. *Management & Prospective*, 40(6), 186–199. doi:10.3917/g2000.406.0186. URL <https://doi.org/10.3917/g2000.406.0186>
- Singla, A. (2024) Cognitive computing emulating human intelligence in AI systems. *Journal of Artificial Intelligence General Science*, 1(1). doi:10.60087/jaigs.v1i1.38. URL <https://doi.org/10.60087/jaigs.v1i1.38>
- Wei, Y. (2024) Exploring the emerging intellectual structure in AI marketing publications: A text analysis study. *Management Research Quarterly*, 1(2), 25–33. doi:10.63029/sf9va853. URL <https://doi.org/10.63029/sf9va853>

Zhang, J. & Gao, X. (2025) Theory, transformation, practice and exploration — a review of *An introduction to computational advertising*. *Management Research Quarterly*, 2(2), 50–52. doi:10.63029/s4q7w409. URL <https://doi.org/10.63029/s4q7w409>

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AUTHORS BIOGRAPHY

Zhibin Jiang is a Zhiyuan Distinguished Scholar at Shanghai International Studies University and a recipient of the State Council Special Government Allowance. He has served as Dean of the School of Journalism and Communication, Dean of the School of Media and Communication, and Director of the Academic Affairs Office at Shanghai International Studies University. He concurrently serves as an expert reviewer for higher education accreditation and evaluation under China's Ministry of Education, Vice Chair of the Advertising and Media Development History Division of the Chinese Journalism History Society, Deputy Director of the Academic Committee of the China Advertising Association, and Director of the National Demonstration Teaching Center for Media Convergence at Shanghai International Studies University. He has led National Social Science Fund of China projects on AI-driven restructuring of advertising operational processes and blockchain-enabled data governance in internet advertising, and a Shanghai Social Science Fund project on the public governance of media service provision, alongside more than ten additional provincial and ministerial-level projects. He has published more than ten monographs and textbooks, and over 30 journal articles in SSCI outlets such as the *Journal of Advertising* and leading Chinese CSSCI journals including *Journalism Bimonthly* (Xinwen Daxue). He has received major teaching achievement awards, including one national first prize and one national second prize, as well as one Shanghai special prize and one Shanghai first prize.

Xin Gao is a doctoral candidate in Business Administration (Organizational Communication) at the School of Business Administration, South China University of Technology. His research focuses on computational advertising and advertising creativity. He has participated in several academic research projects and contributed to publications in related fields.