A Socio-Technical Systems Framework for Embedding Generative AI in Marketing Practices: Bridging Human and Technological Dynamics

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Abstract

Artificial Intelligence (AI) is transforming organizations, societies, and individual behaviors, with marketing identified as a critical area of impact. Despite extensive exploration of AI's role in marketing over the past two decades, the emergence of Generative AI (GenAI) presents unique challenges for sustained adoption. This paper argues for the need for inclusive frameworks that address the complexities of integrating GenAI into marketing management practices. Building on established practice theories and the Service-Dominant (S-D) Logic, we propose a socio-technical systems approach to embedding GenAI into marketing management practices, emphasizing the interaction between human and technological factors. By synthesizing insights from key empirical studies, we underscore the importance of the collaborative processes necessary for sustained adoption, addressing the human factors involved in AI adoption. This review of the literature suggests that, while the potential impact of GenAI on marketing management practices seems to be positive, overcoming implementation challenges is crucial for maximizing its benefits. This paper contributes to the discourse on AI's role in marketing practices, offering a pathway for practitioners and scholars to navigate the transformative landscape of marketing management in the age of GenAI.

Key Words: Generative Artificial Intelligence, Marketing Management Practices, Implementation and Sustained Adoption, Socio-technical systems Perspective

1. Introduction

Artificial Intelligence (AI) is dramatically transforming organizations, societies, and individual behaviors (Kumar, Ashraf, and Nadeem, 2024), with marketing emerging as a critical area of impact (Kshetri, 2023; Davenport et al., 2020; Huang and Rust, 2022). A recent report reveals that 64% of marketers now prioritize AI as a top focus for the upcoming year (The State of Marketing AI Report, 2023), underscoring its growing significance in the field. In 2021, the AI market in marketing was valued at $15.84 billion, with projections indicating an increase to over $107.5 billion by 2028 (Statista, 2023). Despite over two decades of research on AI in marketing (Ma & Sun, 2020; Vlačić et al., 2021), Generative AI (GenAI) represents a significant shift (Dwivedi et al., 2023; Feuerriegel et al., 2023). GenAI is poised to impact nearly all aspects of marketing (Peres et al., 2023) but faces substantial adoption barriers due to its complexity (Amankwah-Amoah et al., 2024; Kshetri et al., 2023).

To address these challenges, inclusive frameworks are essential for integrating GenAI into marketing management (Amankwah-Amoah et al., 2024; Makarius et al., 2020; Kshetri et al., 2023; Yu, Xu, & Ashton, 2023). This paper proposes a broader socio-technical systems perspective to, provide insights to navigate this transformative phase.

Currently, GenAI is at the peak of inflated expectations, as outlined in Gartner's 2023 hype cycle, and is expected to soon enter a phase of disillusionment, where initial excitement wanes as the technology struggles to meet its ambitious promises. This phase doesn't imply GenAI lacks value or potential; rather, it signifies that achieving meaningful business impact will now require more focused, rigorous development and realistic goals (Bant, Poitevin, Greene, and Brethenoux, 2023).

2. Developments in Marketing Management

Philip Kotler, known as the 'Father of Modern Marketing,' introduced the 'marketing mix' (4Ps: Product, Price, Place, Promotion) (Kotler, 1967) and defined marketing management as the strategic process of generating desired responses by creating and offering value (Kotler, 1972). Marketing management has now evolved from 'Marketing 1.0' (focused on production and products) to 'Marketing 4.0,' (traditional to digital), and 'Marketing 5.0,' (human-mimicking technologies serving humanity) (Kotler, Kartajava, and Setiawan, 2021). Marketing has shifted from a product-centric, transactional approach (Levitt, 1960) to a customer-focused, relationship-based model (Mollere et al., 2010; Gronroos, 1994), driven by ICT advancements

(Brady et al., 2002; Dholakia et al., 2010) and the rise of digital marketing, big data, AI, IoT, and blockchain (Chaffey and Ellis-Chadwick, 2019; Kumar et al., 2021).

Lusch et al (2007), traced marketing's evolution from 'To Market' (through 1950) to 'Marketing To' (1950-2010) to 'Marketing With' (2010+), emphasizing collaboration with customers and partners to sustain value.

This reflects a shift toward marketing as a dynamic, relational process (Hunt & Madhavaram, 2020) and a complex adaptive system (Vargo & Lusch, 2004; Vargo et al., 2023). Vargo and Lusch's Service-Dominant (S-D) Logic (2004) highlights intangible assets and relational interactions, connecting traditional and modern digital and systemic approaches (Vargo et al., 2023). Vargo et al. (2023) integrate S-D Logic with theories of emergence, complex adaptive systems, and institutionalization to explain how technologies like GenAI establish niche markets and drive marketing adaptation. 'Emergence' fosters 'adaptation' in complex systems like marketing, enabling GenAI-driven self-adjustment (Vargo et al., 2023). Marketing 5.0 underscores AI as an 'enabler,' urging marketers to strategically deploy tools while keeping humanity central (Kotler, Kartajava, & Setiawan, 2021).

3. Recent Development of Artificial Intelligence towards Generative AI

AI has evolved significantly, driven by technological advancements, resulting in a complex understanding of AI (Manis & Madhavaram, 2023; Berente et al., 2021). Unlike traditional technologies with fixed algorithms, AI adapts dynamically to new inputs (Mikalef et al., 2023). Syam and Sharma (2018) highlight AI's integration of the physical, digital, and biological realms, setting it apart from earlier technological revolutions (Makarius et al., 2020).

The rise of Generative AI (GenAI) is transforming industries, including marketing (Dwivedi et al., 2023). Tools like ChatGPT, MagicWrite, Eleven Labs, DALL_E 2, Midjourney, and Stable Diffusion demonstrate its potential (Peres et al., 2023). Unlike traditional automation focused on routine tasks, GenAI tackles creative challenges like writing and image generation through deep learning (Noy & Zhang, 2023).

ChatGPT termed "the industry's next big disrupter," excels in generating human-like responses, efficiency, and 24/7 availability (Dwivedi et al., 2023). Powered by self-supervised learning, it creates new, plausible content and engages in realistic conversations, handles follow-ups, admits mistakes, and rejects inappropriate requests (Budhwar et al., 2023; Cillo & Rubera, 2024). GenAI, especially ChatGPT, is poised to reshape marketing practices uniquely. Its emergence has intensified competition in AI chatbots, driving innovation, expanding

applications, and introducing risks (Budhwar et al., 2023), necessitating new frameworks to integrate GenAI into marketing management practices.

4. Pre-Generative AI Adoption in Marketing

The integration of AI into marketing began in the early 2000s, driven by advancements in data mining and social media (Kumar et al., 2024). Over two decades, AI has significantly influenced marketing, creating opportunities and challenges as practices evolve (Ma & Sun, 2020; Kumar et al., 2024; Huang & Rust, 2021; De Bruyn et al., 2020). While essential for future competitiveness (Hossain et al., 2022), AI adoption presents costly challenges (Mishra, Ewing, & Cooper, 2022; Haenlein & Kaplan, 2021). Limited adoption stems from expertise shortages, inadequate infrastructure, perceived complexity, and uncertain outcomes, leaving the cost-benefit balance unclear (Bock et al., 2020; Makarius et al., 2020).

While the literature on AI in marketing is fragmented (Feng et al., 2021; Mustak et al., 2021; Verma et al., 2021; Ma and Sun, 2020), there is a growing theoretical foundation (Huang and Rust, 2022; Ma and Sun, 2020) and increasing research into various aspects of AI (Vlačić et al., 2021).

Although AI marketing literature is fragmented (Feng et al., 2021; Mustak et al., 2021; Verma et al., 2021; Ma & Sun, 2020), a theoretical foundation is emerging alongside increasing research (Huang & Rust, 2022; Ma & Sun, 2020; Vlačić et al., 2021). This paper synthesizes insights from thirteen empirical studies on AI in marketing (pre-Generative AI), detailed in Appendix 01. Scholars typically classify AI as Artificial Narrow Intelligence (ANI) while expressing optimism for Artificial General Intelligence (AGI) (Hossain et al., 2022; Guha et al., 2021). Volkmar et al. (2022) propose a revised AI/ML framework emphasizing methods, capabilities, and applications.

Empirical studies explore AI capabilities (Abou-Foul et al., 2023; Hossain et al., 2022; Mikalef et al., 2021), applications (Bonetti et al., 2023; Sowa et al., 2021; Revilla et al., 2023), competencies (Mikalef et al., 2023), AI's multiple intelligences (Leone et al., 2021), strategic use (Wu & Monfort, 2022), and organizational focus (Mishra et al., 2022). Recent research on AI practices and technologies spans adoption stages; decisions, executions, and outcomes; with the thirteen analyzed studies focusing on execution and outcomes (Bonetti et al., 2023).

Organizational-level AI adoption studies frequently use the Technology-Organization-Environment (TOE) framework (Nam et al., 2021; Chen et al., 2022; Gupta et al., 2022; Fu et al., 2023), emphasizing environmental (e.g., competitive pressure, regulatory support) and organizational factors (e.g., management support). Technological factors, as highlighted by

Gupta et al. (2022) and Fu et al. (2023), also play a significant role (Hettiarachchy and Brady, 2024).

4.1. Embedding GenAI in Marketing Management Practices

GenAI's unique traits compel organizations to reevaluate strategies, with institutional pressures and adoption dynamics shedding light on how organizations and societies adapt to transformative technologies (Singh, 2024). The adoption of tools like ChatGPT depends on the alignment of organizational and societal norms regarding their acceptability (Rana et al., 2024; Noy & Zhang, 2023).

Traditional innovation diffusion models, such as the Technology-Organization-Environment (TOE) framework, inadequately address implementation strategies for sustained employee engagement with tools like ChatGPT (Bonetti et al., 2023). New frameworks offering holistic, contextualized approaches are needed to understand emerging technologies beyond models like TAM (Mogaji et al., 2024). In response, Bonetti et al. (2023) and Keegan et al. (2022) propose inclusive models like the 'practice co-evolution' process, where employees co-create and adapt AI practices in retail. Using Activity Theory, Keegan et al. (2022) emphasize addressing sociocultural factors and contradictions in B2B AI adoption.

These studies frame AI adoption as an ongoing, adaptive process (Bonetti et al., 2023; Keegan et al., 2022), while Volkmar et al. (2022) stress the overlooked role of human factors, particularly marketing managers, in successful AI adoption. These studies (Bonetti et al., 2023; Keegan et al., 2022; Volkmar et al., 2022) collectively advocate a socio-technical systems perspective for sustained AI use in marketing, moving beyond traditional diffusion models.

4.2. Marketing Management Practices and GenAI Potential

The empirical studies analyzed in this paper (Appendix 01 – Pre-generative Era) consistently highlight AI's potential to enhance marketing and organizational outcomes, including performance (Mikalef et al., 2021; Mishra et al., 2022; Wu and Monfort, 2022), productivity (Sowa et al., 2021), demand prediction (Revilla et al., 2023), competitive advantage (Hossain et al., 2022), and value co-creation (Leone et al., 2021; Mikalef et al., 2023).

Recent advancements in GenAI tools like ChatGPT and GPT-3.0 demonstrate transformative potential for marketing but also pose significant challenges (Dwivedi et al., 2023). While ChatGPT has emerged as a disruptive innovation, large-scale AI implementation remains difficult due to high resource requirements and organizational adaptation hurdles (Dwivedi et al., 2023). Practical limitations of GenAI include hallucinations (producing inaccurate outputs),

lack of transparency, reliance on outdated information, and data privacy risks (Cillo & Rubera, 2024; Huang & Rust, 2023; Kshetri, 2023). Marketers must also address challenges such as mastering prompt engineering, managing errors, and aligning GenAI with corporate culture to ensure successful adoption (Kshetri, 2023).

Research on ChatGPT and GenAI in marketing is currently limited (Dwivedi et al., 2023; Cillo & Rubera, 2024). This underscores the need to build on foundational studies to refine marketing practices and guide future research (Huang & Rust, 2021). The two empirical studies analyzed in this paper (Appendix 01 – Generative Era) reveal a shift in theoretical approaches, with Institutional Theory offering broader perspectives to capture GenAI's organizational impact. Skålén et al. (2023) expand the American Marketing Association's 2004 definition of marketing by introducing the Marketing-as-Practice (MAP) framework, which emphasizes the interplay of marketing practices, practitioners, and praxis in value creation. They also highlight that marketing research has often overlooked the role of tools and technologies. Bonetti et al. (2023) emphasize understanding how practices evolve and the conditions enabling their evolution.

Shove et al. (as cited in Bonetti, 2023) define practices as the interaction of materialities, competencies, and meanings, while Keegan et al. (2022), using Activity Theory, explore the interplay between material action, mind, and society. *Marketing 5.0* notes that machines interpret behavior, but humans understand underlying attitudes and values (Kotler, Kartajava, & Setiawan, 2021). These findings highlight the limitations of traditional innovation diffusion models in accounting for the human factor, while practice theory often neglects tools and technologies. A combined practice theory and socio-technical systems perspective offers a comprehensive framework for integrating GenAI into marketing management by balancing human and technological elements (Keegan et al., 2022; Bonetti et al., 2023; Vargo et al., 2023).

5. Conclusion

The integration of GenAI in marketing presents transformative opportunities alongside significant challenges. Traditional models inadequately address these complexities, emphasizing the need for inclusive frameworks such as socio-technical systems perspectives. These frameworks effectively balance human and technological elements, enabling sustainable AI adoption. Future research must focus on developing inclusive, dynamic models that unlock GenAI's potential while ensuring marketing practices remain adaptive and human-centered.

Appendix 01 – Summary of Key Empirical Studies on AI and Marketing

Author and the Year	Journal	Theory	Methodology	Context	Type/ Level of AI Used	Main Finding
Pre-Generative Era						
1) Guha et al (2021)	Journal of Retailing		Mono-method qualitative	Retailing – Senior managers	"a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation" (Kaplan and Haenlein, 2019, p. 17)	• Highlight that non-customer-facing AI applications can also provide significant value. In the short term, many AI solutions are expected to augment employees' roles rather than fully replace them
2) Keegan, Dennehy and Naudé (2022)	Information Systems Frontiers	Activity Theory (AT)	Mono-method qualitative	B2B Marketing – Domain Experts	AI-powered marketing	• Illuminated the contradictions that emerge when adopting and implementing AI into traditional B2B marketing practices and the transformative power of contradictions
3) Hossain et al (2022)	Industrial Marketing Management	Resource-based and dynamic capability views	Mono-method quantitative	B2B (export-oriented Manufacturing – readymade garment) - Managers	"a system's ability to interpret external data correctly, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation" (Kaplan and Haenlein, 2019, p. 17)	• Performance of sensing, seizing, and reconfiguring becomes higher for a firm when they adopt AI on the strength of the marketing analytics platform consequently leading to sustained competitive advantages
4) Mikalef, Conboy and Krogstie (2021)	Industrial Marketing Management	Dynamic capabilities and micro-foundation of dynamic capabilities	Mono-method qualitative	High-tech firms - Managers	AI as an enabler of B2B marketing	• AI can enable the processes that comprise dynamic capabilities and thereby revamp the B2B marketing operations. Highlight the contextual nature of AI utilization in organizations, indicating that the value

						of implemented solutions depends on various internal and external factors
5) Leone et al (2021)	Journal of Business Research		Mono-method qualitative	Healthcare organizations – Key informants	Innovative solutions based on four types of AI: Analytical, Mechanical, Intuitive, and empathetic (Hunag and Rust, 2018)	• Generate high-quality service innovation only by leveraging upon different types of AI virtuous value co-creation dynamics through specific mechanisms and taking stock of the contributions of the different types of market knowledge (i.e. customer knowledge, user knowledge, and external market knowledge)
6) Volkmar, Fischer and Reinecke (2022)	Journal of Business Research		Mixed method	Diverse industries – Experts in AI and Marketing	AI refers to machines that perform human intelligence tasks while ML denotes computer programs that can learn without following strict human instructions	• Propose a revised technological framework for using AI and ML in marketing (AI methods, AI capabilities, and AI applications). Explore the drivers of and barriers to AI and ML in marketing by adopting a dual strategic and behavioral focus (inward and outward) to better understand the human factor behind AI and ML
7) Wu and Monfort (2022)	Psychology & marketing	Resource-based view	Mono-method quantitative	Food franchises and chain stores – CEO and Marketing Managers	Role of AI as a marketing strategy (STP/ 4Ps and CRM)	• Marketing capabilities, customer value co-creation, and market orientation are positively related to performance and affect the development of AI marketing strategies and the above factors are necessary and sufficient recipes for higher firm performance
8) Abou-Foul et al (2023)	Journal of Business Research	Dynamic capabilities literature	Mono-method quantitative	manufacturing firms – Key informants	AI capabilities - A firm's ability to select, orchestrate, and leverage its AI-specific resources, in order to identify, interpret, make inferences, and learn from data to achieve	• AI capabilities designed for leveraging societal good, resource optimization, and process optimization are sufficient to lead to servitization

					predetermined organizational and societal goals	
9) Mishra et al (2022)	Journal of the Academy of Marketing Science	economic and marketing theory	Mono-method qualitative	Fama French industries – highly qualified AI experts	AI focus, which is constructed by counting the frequency of 122 AI-related keywords and phrases in firms' 10-K filing	• AI focus is negatively correlated with gross operating efficiency (sales per employee), whereas AI focus has a positive correlation with net efficiency measures (sales, return on sales, return on marketing investment, and net profit per employee)
10) Mikalef et al (2023)	Journal of Business Research	core competency theory	Mono-method quantitative	B2B marketing – IT managers with expertise on AI and business	AI competencies (Infrastructure, business spanning, proactive stance) are the creative bundling of technologies, organizational knowledge, and institutions as a harmonious whole (Prahalad, 1993) resulting in business value	• AI competencies affect organizational performance indirectly by enhancing B2B marketing capabilities. The impact of AI competencies on the different types of B2B marketing capabilities is not equal
11) Bonetti, Montecchi, Plangger and Schau (2023)	Journal of the Academy of Marketing Science	Theories of practice, knowledge transfer and strategic enablement literature	Multi-method qualitative	Retail – retailers, business consultants, and technology providers	AI applications are increasingly used to augment customer experiences and the efficiency of retail operations	• Empirically derives a recursive phasic model of practice co-evolution. practice co-evolution occurs in three collaborative phases of co-envisioning, co-adapting, and co-(re)aligning, also revealing the mechanism of practice enablement that facilitates sustained usage of AI investments among retail employees
12) Sowa et al (2021)	Journal of Business Research		Mixed method	Managerial professions	Cobots	• Distinguished between four levels of proximity between AI and humans in a work setting. Highlight a n increased productivity due to enhanced human-AI collaboration. Participant opinions are different

						between and within age groups but no difference between gender and education level
13) Revilla et al (2023)	Journal of management information systems		Mono-method qualitative	FMCG – data from the supplier's intelligent demand adjustment system and key e-commerce customer	AI application AI/ML driven predictions	• Distinguish between three types of human-AIML collaboration: automation, adjustable automation, and augmentation. Human intervention complements AIML-driven forecasts most effectively (augmentation) in predictions with long time horizons and low uncertainty. A moderate level of human intervention is likely to result in the best predictive performance in human-AIML collaboration
Generative Era						
14) Rana et al (2024)	Technovation	Institutional theory and FATAA ethical principles (fairness, accountability, transparency, accuracy, autonomy)	Mono-method quantitative	IT and ITeS in India– senior managers, project heads and CTOs	GenAI adoption and organization performance	• Coercive, normative, and mimetic forces influence the use of GenAI and mimetic pressure has a relatively higher magnitude of influence on the use of GenAI. FATAA ethical principles influence the use of GenAI. The use of GenAI influences organizational performance and is moderated by organizational innovativeness
15) Noy and Zhang (2023)	Science		Mono-method quantitative	Midlevel professional writing tasks - marketers, grant writers, consultants, data analysts, HR professionals, and managers	Productivity effects of generative artificial intelligence – assistive chatbot (ChatGPT)	• ChatGPT substantially raised productivity - the average time taken decreased by 40% and output quality rose by 18%. Inequality between workers decreased, and concern and excitement about AI temporarily rose.

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