

Empowerment Mechanisms and Innovation Paths of Artificial Intelligence Marketing from the Perspective of Human-Machine Collaboration

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Abstract: Artificial intelligence is transforming marketing from an efficiency-enhancing tool into a new paradigm of human-machine collaboration. This study examines the conceptual evolution of AI in marketing through a theoretical lens, tracing its progression from a technical tool to a strategic core and ultimately evolving into a collaborative ecosystem. The paper analyzes the comprehensive mechanisms of AI integration into STP strategy and the 4P framework, and identifies three pathways for advancing marketing innovation through human-machine synergy. Relevant research indicates that collaboration between humans and AI does not imply machine replacement but rather achieves a dynamic balance between skill transfer and capability reconfiguration, liberating humans from routine tasks to focus on innovation and strategic planning. Future marketing competition will shift from mere technological prowess comparisons to comprehensive evaluations of human-machine collaboration effectiveness and value creation capabilities.

Keywords: Artificial intelligence marketing; Human-machine collaboration; Empowerment mechanism; STP strategy; 4P strategy

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1. Introduction

From the steam age to the digital age, the trajectory of technological evolution has consistently revolved around “how to produce”—how to manufacture, scale production, and achieve precision. Artificial intelligence, however, addresses a more fundamental question: who creates? This represents not merely an improvement in efficiency but a comprehensive transformation of the key elements of productivity^[10]. By integrating general-purpose technologies with natural language interfaces, artificial intelligence enables people to conveniently access various technical resources. When tasks such as code writing, interface design, and data processing can be performed using natural language commands, humans become less dependent on specialized tools. The primary significance of AI lies in achieving a dynamic balance between deconstructing existing skills and redefining capabilities; as technical barriers gradually diminish, the importance of cognition and judgment becomes more pronounced; mechanical, repetitive tasks are replaced, making the unique value of innovation

and creativity all the more valuable.

Today, artificial intelligence marketing is transitioning from feasibility testing to a critical phase of comprehensive application. This shift raises a pressing theoretical question in practice: How can AI and humans collaborate effectively in the field of marketing? What are the underlying mechanisms of this synergy? And how can such collaboration redefine the enabling models of marketing and drive its innovative development^[11]?

Against this backdrop, this paper adopts a theoretical approach to human-machine collaboration, conducting an in-depth analysis of the enabling mechanisms and innovative approaches of artificial intelligence in marketing. It summarizes the conceptual evolution of AI marketing—from a technical perspective to one of paradigm shift—and proposes a tripartite empowerment framework encompassing perception, decision-making, and execution, while identifying three pathways through which human-machine collaboration can drive marketing transformation.

2. The evolving relationship between artificial intelligence and marketing: From auxiliary tools to deep integration

2.1. The perspective of technical tools: AI as an efficiency enhancer

In the early stages of AI marketing research, the academic community generally defined it as the integrated application of various intelligent technologies. According to research by Davenport *et al.*, artificial intelligence is essentially a tool for enhancing analytical capabilities, with its primary value lying in improving marketing forecasting accuracy and deep data processing capacity^[1]. The purpose of AI is not to replace marketers but to optimize decision-making processes through automation and intelligent technologies, enabling individuals to make more precise and efficient choices in dynamic markets. This perspective establishes AI's fundamental role as an efficiency-enhancing tool; however, it also implies a limitation: the relationship between humans and AI is viewed as one-way control between operator and tool, rather than a collaborative partnership.

2.2. Strategic empowerment perspective: AI as the decision-making brain

As technological practices continue to advance, the conceptual scope of artificial intelligence has gradually transcended the limitations inherent in the tool itself. Huang and Rust emphasized that AI has moved beyond its auxiliary role in traditional marketing to become a strategic core that redefines marketing thinking^[2]. It is fully integrated throughout the entire process of perception, decision-making, and action, enabling businesses to shift their marketing approach from passive response to proactive prediction. At this stage, AI evolves from a supportive tool into a central resource for strategic development, and the interaction between humans and AI shifts from that between operator and tool to that between leader and intelligent assistant. AI handles data analysis and strategy formulation, while final decisions remain under human control. Nevertheless, within this relationship model, a clear hierarchical division between humans and machines remains evident, indicating that deep collaboration has not yet been achieved.

2.3. The paradigm revolution perspective: AI as a collaborative ecosystem

A more forward-looking perspective suggests that AI-driven marketing will foster conceptual innovation. The four-stage AI framework proposed by researchers such as Shi Feng—namely AI cognition, AI empowerment, AI interaction, and AI integration—illustrates the evolution of AI-powered marketing. This framework indicates that marketing transformation begins with consumers' subjective understanding of AI technology, followed by its gradual integration into the marketing 4P framework, reshaping consumer experiences through human-machine collaboration, and ultimately achieving systematic integration between technology and enterprises^[7]

(as shown in **Figure 1**). Professor Wang Yonggui notes that marketing intelligence is a technological system primarily driven by demand insight and demand innovation, capable of providing systematic support throughout the entire process from demand identification to demand fulfillment^[8].

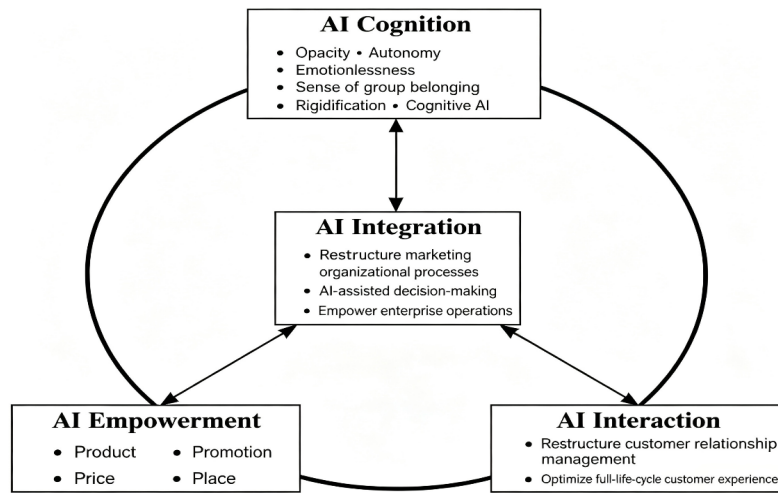


Figure 1. Conceptual framework for research on AI-driven marketing transformation^[7]

In the evolution of theoretical frameworks, human-machine collaboration has gradually become the core concept for understanding the essence of AI-driven marketing. This collaboration is not merely about combining humans and machines, but rather a novel cognitive approach: humans undertake strategic decision-making, value orientation, and creative design, while artificial intelligence handles data analysis, pattern identification, and efficient implementation^[3]. The relationship between the two has progressively shifted from one of dominance and subordination to equal partnership, allowing both parties to fully leverage their respective strengths and establish a mutually reinforcing cognitive ecosystem. Enterprises with strategic advantages are those capable of widely implementing human-machine collaboration systems and effectively integrating human judgment with machine flexibility within an innovative cognitive framework^[4].

3. Strategies and empowerment mechanisms for AI marketing from a human-machine collaboration perspective

3.1. Human-machine collaboration reconfiguration in the STP strategy

3.1.1. Market segmentation: Transitioning from traditional concepts to dynamic analysis

Traditional market segmentation approaches, relying on a single data perspective and manual judgment, often exhibit limitations: their results tend to be generalized and imprecise, and they struggle to respond swiftly to dynamic market changes. Artificial intelligence operates through real-time analysis of vast amounts of multidimensional data; by employing clustering techniques and deep learning algorithms, it can proactively identify underlying user behavior patterns and deep-seated needs, transforming traditional static classification into a dynamically updated system of precise insights. AI handles data analysis, pattern recognition, and the implementation of segmentation strategies, while humans define segmentation objectives and value assessment criteria. For example, determining which segments hold strategic importance, which needs warrant priority attention, and how to balance segmentation depth and refinement levels^[7]. This creates a collaborative model where machines explore potential while humans evaluate significance^[12].

3.1.2. Target market selection: Transition from traditional manual evaluation to human-machine collaborative decision-making

Artificial intelligence employs machine learning algorithms to predict trends in demand changes, and utilizes sentiment analysis technology to identify unmet market needs from social media comments. Taking Zionex's baseline forecasting module as an example, this module integrates diverse data sources—including historical sales records, weather information, economic indicators, and consumer sentiment—effectively overcoming the limitations of traditional linear forecasting and significantly enhancing prediction accuracy^[1]. Ultimately, market decisions require comprehensive evaluation based on the company's strategic planning, resource strengths, and risk tolerance. The key principles of human-machine collaborative decision-making are: artificial intelligence is responsible for predicting potential scenarios and their probabilities, while humans determine whether to intervene and how to do so^[11].

3.1.3. Market positioning: From unidirectional delivery to collaborative value creation

Artificial intelligence helps brand stories not only enhance content creation efficiency but also strengthen emotional connections with users through personalized interactions. Lancôme launched an AI-powered skin analysis device called E-youth Finder in Singapore. By simply uploading a selfie, users can have their skin condition accurately assessed and receive customized skincare recommendations, transforming the brand image from mere information dissemination into an interactive experience that co-creates value with consumers^[5]. While artificial intelligence handles technical implementation and service expansion capabilities, humans focus on defining brand value positioning and shaping emotional resonance. AI expands service offerings, whereas humans safeguard the brand's core values.

3.2. Human-machine collaboration upgrade for the 4P strategy

3.2.1. Product: AI permeates the entire innovation process

During the design and development process of new products, artificial intelligence employs natural language processing technology to rapidly extract and analyze unstructured user feedback, transforming complex market uncertainties into clear data insights^[2]. For highly practical products, consumers are more receptive to AI recommendations; for entertainment-oriented products, they prefer suggestions provided by humans^[13]. The functions of artificial intelligence encompass three critical phases: creative generation, business strategy formulation, and development evaluation. During the creative exploration phase, AI identifies unmet needs and potential innovation opportunities through user feedback, enabling the creative team to develop forward-looking concepts. In the business planning stage, AI generates market forecasts and conducts risk analysis, informing managerial investment decisions. Throughout product development and testing phases, AI drives rapid prototype iteration while human experts oversee design direction and improvements in user experience standards.

3.2.2. Pricing: From static pricing to intelligent dynamic pricing

Artificial intelligence is transforming pricing mechanisms from traditional single, static models to multifaceted dynamic approaches. AI focuses on processing data and optimizing pricing within milliseconds, while humans establish the ethical frameworks and constraints for pricing strategies. Tesla's FSD Insurance system collects driving behavior data via in-car sensors to generate personalized UBI pricing plans tailored to individual drivers; meanwhile, JD's intelligent supply chain leverages operations research algorithms and AI models to perform real-time dynamic price adjustments for a wide range of inventory items, taking into account factors such as product lifecycle, promotional campaigns, and market competition^[8]. Research indicates that in

practical applications, consumers perceive AI-driven pricing less deliberately than traditional manual pricing, thereby experiencing a stronger sense of price fairness^[4].

3.2.3. Channels: From linear transmission to intelligent networks

Artificial intelligence breaks down data barriers between online and offline platforms, establishing unified and efficient intelligent channel solutions. In channel planning, AI integrates user behavior patterns, regional demand characteristics, and traffic distribution patterns to estimate the cost-effectiveness of different channel combinations^[3]. During the service phase, intelligent recommendation systems and virtual assistants provide personalized assistance; Kuaishou's AI-powered virtual try-on feature has significantly reduced fitting time from 7–15 minutes to seconds. In logistics operations, JD's unmanned warehouses employ various smart devices that leverage image recognition and deep learning technologies to efficiently handle complex warehousing tasks. Artificial intelligence handles data integration, route optimization, and automated processes, while humans focus on developing comprehensive channel strategies and enhancing emotional engagement with user experiences.

3.2.4. Promotion: From unidirectional output to human-machine co-creation

Artificial intelligence is comprehensively transforming the advertising industry ecosystem by reshaping strategic planning, content creation, campaign optimization, and operational management. The evolution of intelligent advertising can be categorized into interactive advertising, programmatic advertising, and ultimately the era of smart advertising. Tencent Ads' AI platform automatically generates promotional copy and scripts suitable for multiple platforms based on product information; Baidu's DuMi utilizes natural language processing technology to create marketing content in real time, significantly reducing the time gap between ad placement and consumer engagement compared to traditional methods^[5]; Walmart leverages consumer browsing and purchasing behavior data to enhance the precision of targeted advertising. While AI handles large-scale content generation, multi-platform adaptation, and real-time performance optimization, humans focus on shaping creative concepts, brand identity, and emotional resonance. Together, they establish a collaborative model where AI expands scale while humans refine quality.

4. Three key approaches of human-machine collaboration in driving marketing innovation

4.1. Content co-creation: From “tool-assisted support” to “creative partner”

The role of artificial intelligence in content creation is evolving from a mere auxiliary tool to a creative collaborator. The advancement of multimodal AI has driven this transformation, enabling simultaneous processing of diverse information formats—including text, images, videos, and audio—and facilitating the creation of content that integrates multimedia elements^[6]. Netflix utilizes AI to generate personalized movie covers for users, while L'Oréal employs AI technology to produce various visual content and enhances ad effectiveness through A/B testing^[9].

The role of creative collaboration in BI has sparked discussions about the authority of originality. While artificial intelligence can generate extensive textual and visual content from existing data, the primary value of human creators lies in complementing AI's strengths. AI excels at pattern recognition and optimal combination of known information—essentially reorganizing existing elements—while humans demonstrate distinct capabilities in creative imagination, emotional resonance, and value assessment, enabling the exploration of entirely new possibilities and innovation in uncharted territories. The human-AI collaboration process typically

unfolds as follows: AI handles data analysis, creative inspiration, initial drafting, and A/B testing optimization, whereas humans focus on original conceptualization, brand style consistency, emotional engagement, and final decision-making. Together, they establish a cyclical framework involving AI-driven stimulation, human design, intelligent validation, and human judgment.

4.2. Life-centric approach: From “static recording” to “dynamic life”

Artificial intelligence is transforming customer relationship management from a static record-keeping tool into a dynamic, living entity. The future development of CRM driven by generative AI will bring about multifaceted changes (see **Figure 2** for details).

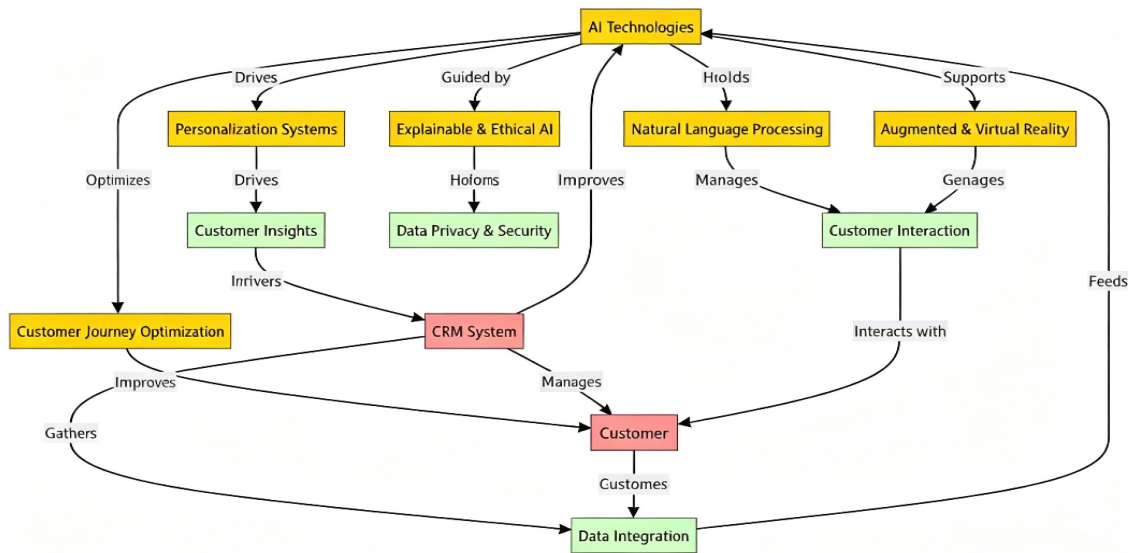


Figure 2. The future direction of customer relationship management driven by generative AI ^[5]

The transformation manifests in four key areas: In omnichannel data integration, AI eliminates data silos and consolidates multi-touchpoint information into unified customer profiles; for real-time dynamic profiling, AI-CRM establishes an up-to-date knowledge network that comprehensively captures customer sentiment fluctuations, value shifts, and behavioral patterns; regarding churn prediction and intervention, AI employs churn probability models to identify risks proactively and automatically initiates targeted retention strategies; in data-driven growth, AI systematically enhances customer lifetime value ^[8].

The boundaries between human and AI collaboration are well-defined: artificial intelligence focuses on interpreting consumer behavior, leveraging data analysis to identify demand trends, predict behavioral shifts, and alert to potential customer churn; humans concentrate on responding to customers by providing emotionally engaging personalized services, addressing complex issues, and building trust-based relationships during key interaction phases. AI expands the scope of customer relationship management, while humans enrich the emotional dimension of these relationships. Although emotional intelligence enables AI to recognize emotions, truly profound connections must still be forged through resonance in shared thoughts and values between individuals.

4.3. Intelligent decision-making: From “experience-driven” to a closed loop of “data–insight–action”

Artificial intelligence is driving marketing decisions away from reliance on experience toward data-driven transformation. The key to this shift lies in establishing a robust closed loop that integrates data, insights, and

action: AI handles data collection and generation, processes it into actionable insights, which directly enhance personalized services and user interaction experiences^[15]. Data privacy and security, algorithmic transparency, and AI ethics form the core safeguard framework, comprehensively covering and regulating the entire process cycle. Throughout this complete cyclical process, the boundaries of collaboration between humans and artificial intelligence become increasingly clear, gradually establishing a robust cooperative framework: AI handles data collection, pattern analysis, solution development, and outcome monitoring; while humans focus on goal setting, value assessment, ethical review, and innovation guidance^[14].

In cutting-edge application domains, AI-driven marketing is transforming user interaction from purely functional needs toward emotional connections through virtual brand ambassadors, intelligent social robots, virtual assistants, and AI-powered customer service.

5. Conclusion and prospects

This study builds upon the theory of human-machine collaboration to thoroughly examine the mechanisms of artificial intelligence's application in marketing and pathways for its innovative development. The research indicates that AI-driven marketing has undergone three distinct phases of evolution: evolving from a technical support tool into a strategic priority, and ultimately progressing toward a collaborative ecosystem. Human-machine collaboration does not entail artificial intelligence replacing humans; rather, it leverages a dialectical relationship between skill simplification and capability reconfiguration, enabling humans to free themselves from mechanical tasks and focus on core areas such as creativity stimulation and strategic decision-making.

In terms of empowerment mechanisms, Artificial intelligence has been deeply integrated into the STP strategy and the 4P strategy. Regarding market segmentation, it shifts from established empirical analysis to dynamic, in-depth insights; in target market selection, it evolves from single-human judgment to human-machine collaborative decision-making; and in market positioning, it transitions from traditional one-way communication to an interactive model focused on co-creating value. In four key areas—product innovation, intelligent pricing, channel optimization, and promotional strategy reform—artificial intelligence is gradually evolving from a supporting tool into an indispensable intelligent collaboration partner.

In terms of innovative approaches, human-machine collaboration enables marketing to achieve three major transformations: content evolves from a simple tool into a creative partner, with humans overseeing original design and brand coordination; relationships shift from mere documentation to dynamic interaction, where AI handles comprehensive analysis and automated operations while humans focus on building emotional resonance and trust; decision-making moves from being experience-driven to data-driven insights and closed-loop execution, with AI performing data processing and solution development while humans concentrate on value assessment and strategic direction.

The core of future marketing competition will shift from a mere comparison of technical capabilities to a comprehensive contest of human-machine collaboration efficiency and value creation capacity. Enterprises that strike the optimal balance between manual decision-making and artificial intelligence will establish lasting competitive advantages in this new era of intelligent marketing. The fundamental significance of this transformation lies in enabling humans to focus more on exploring the underlying values behind actions, while tools handle task execution.

Disclosure statement

The author declares no conflict of interest.

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