A New Development Matrix for Generative AI Applications in Marketing

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***Abstract*—According to the rapid advancements and fundamental transformations brought by generative Artificial Intelligence (AI), the marketing industry is experiencing significant changes. It offers advanced capabilities for content creation, customer engagement, and predictive analytics. However, the lack of domain-specific frameworks tailored for marketing obstructs the full utilization of these tools. This study introduces a new development matrix for generative AI applications in marketing, focusing on two key dimensions: personalization and clear data sources. By conducting a systematic literature review using the PRISMA methodology, this research collected insights from 142 publications and synthesized findings from 53 of them. The proposed matrix categorizes generative AI tools into four quadrants: Precise Personalization, Tailored Potential, Limited Insights, and Aimless Exploration. These categories highlight the importance of integrating personalized configurations with accurate and well-defined data sources to optimize marketing outcomes. The findings indicate that further development of generative AI for marketing can focus on personalization and clear data sources to align with the unique demands of marketing strategies. In the future, research will be encouraged to explore additional variables, such as localization and the influence of celebrity endorsements, to expand the applicability of this framework.**

***Keywords*—marketing, generative Artificial Intelligence (AI), personalized marketing, data sources**

I. Introduction

Generative Artificial Intelligence (AI) is a powerful tool capable of autonomously generating content such as text and images in response to user inputs. With continuous advancements in technology, generative AI is increasingly being integrated into various fields to enhance efficiency and optimize outcomes (Feuerriegel, Hartmann, Janiesch, & Zschech, 2023). In the marketing domain, generative AI has emerged as a valuable tool for content creation, revolutionizing interactions between brands and consumers through applications ranging from drafting copy (Sreynich, 2022) to predicting audience preferences (Lazaroiu, & Rogalska, 2024).

Despite these advancements, a generative AI concept specifically tailored to the needs of the marketing industry has yet to be developed. For instance, previous research has called for the development of a generative AI concept customized for the travel industry. These studies suggested using domain-specific and reliable travel data to train Large Language Models (LLMs) and emphasized that fine-tuning these models with the latest data could be more practical and effective (Hsu, Tan, & Stantic, 2024).

Building on these insights, this study addresses two critical challenges in the intersection of marketing and generative AI. First, since the advent of digital marketing, performance analyses of personalized marketing research have shown steady growth in publication output and citation impact over the years, indicating a promising trajectory for future development (Chandra, Verma, Lim, Kumar, & Donthu, 2022). Accordingly, this research seeks to examine the strategic importance of personalized marketing and its potential integration with generative AI applications. Second, despite significant advancements in generative AI, persistent concerns about the accuracy and reliability of its outputs have emerged. These inaccuracies can lead to serious implications, including flawed decision-making, misinformation propagation, and privacy breaches. Some studies have begun to tackle these issues by analyzing foundational data from multimodal data lakes—such as text files, spreadsheets, and knowledge graphs—and assessing their quality and consistency (Tang, Yang, Fan, Cao, Luo, & Halevy, 2023). Therefore, this study also focuses on exploring the integrity and relevance of data sources utilized in marketing-focused generative AI to address these challenges effectively.

Given that a matrix can be used to identify and describe the relationships between concepts (Kozmenko, Kozmenko, Henze, Schellpfeffer, & Kaye, 2019), enabling the identification of all possible pairwise connections and clearly articulating structural issues (Williams, 2009). This study therefore conducts a systematic review and synthesis of relevant literature, leveraging the PRISMA methodology to propose a novel matrix. This matrix aims to identify the key dimensions of generative AI that are most suitable for application in marketing contexts.

II. Methodology

The systematic literature review involves literature retrieval and literature screening (Patole, 2021). This section follows these two steps to collect literature on the use of generative AI in marketing, as detailed below:

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A. Literature Retrieval

This study collected existing research papers and publications related to generative AI in the marketing domain using the Google Scholar search engine. The process involved a series of keywords such as "generative AI," "marketing," "personalized marketing," and "marketing database." A total of 142 research publications were gathered.

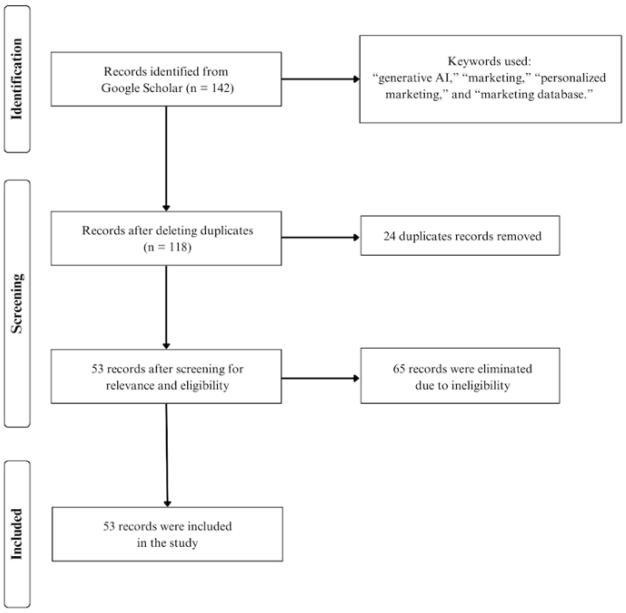

Fig. 1. PRISMA flow chart.

B. Literature Screening

The PRISMA methodology, a well-known and rigorous technique for systematic reviews and meta-analyses, guided the literature screening process for this study (Naqbi, Bahroun, & Ahmed, 2024), as illustrated in Fig. 1. Initially, the study identified 142 papers. After removing duplicates, 118 papers retained.

In the early 2020s, with the introduction of Bard and ChatGPT, the AI chatbot market experienced rapid expansion (Al-Aminm, Ali, Salam, Khan, Ali, Ullah, Alam, Chowdhury, 2024). The launch of ChatGPT by OpenAI in November 2022 further accelerated discussions around generative AI. As advancements in technology led to an increase in related publications, a strict review process was conducted to ensure the exclusion of outdated information. Ultimately, the screening retained 53 relevant reviews, articles, and publications published through 2024.

III. Content Analysis

As generative AI technology evolves, it's becoming an increasingly valuable tool in marketing, with applications ranging from content creation and data analysis to personalized campaigns. This section takes a closer look at how generative AI is being used in the marketing field, explore in depth its role in personalized marketing and examines the foundational data behind generative AI tools.

A. Generative AI in Marketing

With the growing adoption of generative AI, an increasing number of related studies have been published. As shown in Table I, the table lists various pieces of literature on the applications of generative AI in marketing, including articles focusing on its use in B2B marketing and sales operations, as well as research on tools like GPT-4. Due to space limitations, this table includes only 5 references. For further details, please contact the authors.

TABLE I. Generative AI in Marketing Literature

Themes	Authors	Focus
Generative AI in Marketing	H. A. Naqbi, Z. Bahroun and V. Ahmed	This study emphasizes the need for improving generative AI design and strategic long-term planning, particularly in assessing its impact on user experiences across various professional domains (Naqbi *et al*., 2024).
	O. Albu, I. Ciurea, R. Duță and F. Bellini	The research focuses on identifying key themes in the literature on generative AI in marketing, examining the main findings and trends across various research reports, and pinpointing the leading authors researching the impact of generative AI, utilizing the VOSviewer data visualization tool for analysis (Albu, Ciurea, Duță, & Bellini, 2024).
	K. Aldous, J. Salminen, A. Farooq, S. G. Jung and B. Jansen	This article focuses on comparing content created by GPT-4 across different platforms, highlighting its potential as a valuable tool for cross-platform content creation (Aldous, Salminen, Farooq, Jung, & Jansen, 2024).
	A. B. Bhatnagar, A. K. Srivastava, P. Kataria, S. Shukla and J. Singh	Bibliometric analysis reveals four research theme clusters of generative AI: marketing orientation, service innovation, customer relationship management, and generative language models (Bhatnagar, Srivastava, Kataria, Shukla, & Singh, 2024).
	B. B. Routray	Through prudent policies and efforts to develop complementary human skills, generative AI can actively support advertising, branding, and overall creativity while preserving the uniquely human talents of strategic thinking and aesthetic judgment (Routray, 2024).

B. Personalized Marketing and Generative AI

Since the mid-20th century, customer expectations have evolved. At that time, product accessibility was the key to dominating the market. Today, customers seek to stand out from the crowd, placing emphasis on uniqueness and personalization. Marketers identified this underlying demand, and the concept of personalization began to emerge with the spread of technological advancements (Chandra *et al*., 2022). Moreover, today's leaders in personalization have found effective methods that can drive revenue growth by 5% to 15%, while improving marketing spend efficiency by 10% to 30% (Boudet, Gregg, Rathje, Stein, & Vollhardt, 2019). As a result,

Table II compiles generative AI applications related to personalized marketing, providing an in-depth understanding of how generative AI is used to achieve personalized marketing. Due to space limitations, this table includes only 5 references. For further details, please contact the authors.

TABLE II. PERSONALIZED MARKETING AND GENERATIVE AI LITERATURE

Themes	Authors	Focus
Personalized Marketing	M. Aadil, V. K. Bodepu, V. Dharshini and D. Lakamsani	In business behavior analysis, the future directions for the responsible application of generative AI include Explainable Artificial Intelligence (XAI) and algorithmic fairness (Aadil, Bodepu, Dharshini, & Lakamsani, 2024).
	O. A. Acar	This paper examines the impact of generative AI on cost efficiency and scalability, personalization and accessibility, as well as creativity and innovation (Acar, 2024).
	I. A. Adeniran, C. P. Efunniyi, O. S. Osundare and A. O. Abhulimen	This paper explores personalization as a key marketing strategy, discusses methods for achieving personalization through data analysis, and emphasizes the importance of customer segmentation (Adeniran, Efunniyi, Osundare, & Abhulimen, 2024).
	M. F. A. Mamun	The study focuses on the study of Digital Content Marketing (DCM), highlighting how generative AI significantly impacts digital content creation by offering efficiency, personalization, and enhanced customer insights, thereby alleviating the workload of marketers (Mamun, 2024).
	T. Arumugam, R. Arun, S. Natarajan, K. K. Thoti, P. Shanthi and U. K. Kommuri	The development of AI and machine learning can assist organizations in understanding their customers, enabling them to better target audiences and personalize advertisements, marketing campaigns, and information (Arumugam, Arun, Natarajan, Thoti, Shanthi, & Kommuri, 2024).

C. Data Sources for Generative AI in Marketing

Generative AI tools currently available on the market do not indicate sources when generating content, often leading to unclear references or inaccuracies in the generated content. Through Table III, a deeper understanding can be gained of how to establish datasets for generative AI in the marketing field, as well as the dataset-related issues currently faced by generative AI.

TABLE III. DATA SOURCES FOR GENERATIVE AI IN MARKETING LITERATURE

Themes	Authors	Focus
Data Sources for Generative AI in Marketing	P. Cillo and G. Rubera	The study establishes a roadmap for future research on generative AI in the marketing domain, divided into two main areas. The first area focuses on how businesses can leverage the potential of generative AI throughout the innovation process. The second set of research questions examines the implications of using generative AI for analytics (Cillo, & Rubera, 2024).
	S. Dimitrieska	In the field of marketing, generative AI plays a significant role. While generative AI offers substantial advantages, it also presents challenges such as ethical concerns, the dissemination of outdated or inaccurate data, and the lack of legal regulation and oversight, which impact marketing, particularly advertising (Dimitrieska, 2024).
	T. Islam, A. Miron, M. Nandy, J. Choudrie, X. Liu and Y. Li	Focuses on MARK-GEN, a conceptual framework that leverages generative AI models to transform marketing content creation, emphasizing how generative AI technologies are used to produce compelling marketing content (Islam, Miron, Nandy, Choudrie, Liu, & Li, 2024).
	U. Khan and K. A. Khan	Reveals concerns about data privacy, customer trust, and ethical considerations in the implementation of generative AI. However, participants also acknowledged its potential to enhance personalization, engagement, and operational efficiency (Khan, & Khan, 2024).
	D. Patil, N. L. Rane and J. Rane	Emphasizes the necessity of strategic AI integration, recommending that companies investing in responsible and ethical AI usage can better harness generative AI's transformative potential, ensuring sustainable growth and competitive advantage in the digital landscape (Patil, Rane, & Rane, 2024).
	C. Schamp, J. Hartmann and D. Herhausen	Provides a guide for marketers and AI practitioners on effectively training generative AI models while addressing challenges related to bias and data quality (Schamp, Hartmann, & Herhausen, 2024).

IV. MATRIX FRAMEWORK

According to the above, this study has developed a simple matrix, as shown in Fig. 2. The matrix categorizes generative AI tools based on the presence of personalization settings and clear data sources, and suggests that tools in the Precise Personalization quadrant are likely the most suitable for use in the marketing field.

A. Precise Personalization

In the "Precise Personalization" quadrant, generative AI possesses well-defined data sources and personalized settings, enabling the provision of more precise marketing strategies. Currently, no generative AI tools on the market are classified within this quadrant. This study strongly advocates for future development of generative AI tools to follow this trajectory. By leveraging existing literature and data to establish a comprehensive marketing data repository, and training models to achieve personalized configurations, it is possible to create a generative AI tool optimally suited for applications in the marketing domain.

B. Tailored Potential

This quadrant is called "Tailored Potential." Generative AI positioned within this quadrant, while equipped with personalized settings, lacks well-defined data sources. This study argues that such a setup, despite its potential for customization, is limited in accuracy. Given that ChatGPT, developed by OpenAI, allows users to create "My GPTs," this study classifies ChatGPT within this quadrant.

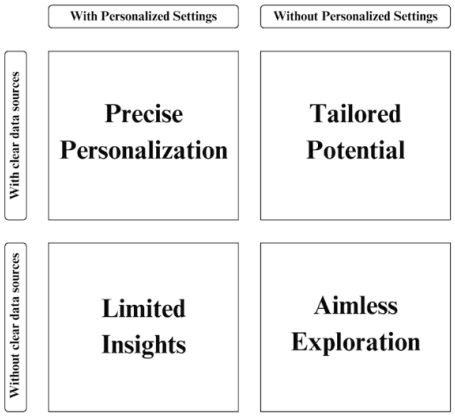

Fig. 2. Gemerative AI marketing matrix.

C. Limited Insights

To discuss "Limited Insights," generative AI tools in this quadrant possess well-defined data sources yet lack personalized settings. This results in data-driven outputs that lack the nuanced customization required for highly personalized marketing strategies. This study classifies Perplexity within this quadrant, as it does not support the creation of personalized systems but consistently provides clear citations for its data sources in every interaction.

D. Aimless Exploration

The "Aimless Exploration" quadrant is characterized by a lack of well-defined data sources and personalized settings. Generative AI tools in this quadrant provide marketing insights that appear vague and lack clear direction, which is a situation this study views less favorably. In this research, Claude is classified in this category. Although it is generally regarded as a superior tool for generating copy, this study argues that personalized configurations and clear data sources remain extremely important requirements.

V. Conclusions and Future Work

To sum up, this study presents a novel matrix in marketing field. The research indicates a close relationship between generative AI in marketing, personalized marketing, and clear, accurate data sources. If generative AI tools can produce more unique and personalized content, not only will the user experience be improved, but more suitable marketing strategies can also be developed.

According to the limitations, there are still many issues to be explored regarding how to establish the most effective generative AI tools for marketing. Therefore, future research is encouraged to explore other variables, such as localization degree, the influence of celebrity endorsements, ethical considerations, or even the actual development of a generative AI tool specifically designed for the marketing domain. Furthermore, establishing dedicated marketing databases is recommended to ensure that generative AI can produce content that better aligns with market demands and maintains high data quality. As for personalization, existing models can be fine-tuned to enhance the quality of AI-generated marketing content, and it is encouraged to evaluate the actual differences in effectiveness through A/B testing.

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