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Artificial Intelligence and its Role in Personalized Marketing for Effective Customer Engagement

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Artificial intelligence (AI) is changing the marketing landscape. Due to AI, organizations can develop strategies that are focused on individual consumers and dynamically adapt marketing tactics in real-time based on large volumes of consumer data. Considering the challenges associated with consumers' increasing expectations, AI provides a basis for personalization and enhanced consumer engagement. As such, studies are required to address how AI can provide new basis for implementation in digital marketing strategies and tactics. Therefore, this paper aims to provide a structured conceptual framework that categorizes AI-driven customer engagement based on personalization. Future directions for research are also addressed to provide an agenda on AI's influence in marketing strategy.

Keywords: *artificial intelligence, marketing strategy, personalization, customer engagement*

JEL Classification: *M31*

1. Introduction

Traditional marketing strategies primarily focused on demographic segmentation and targeting. As such, marketers established categories of consumers considering observable variables (gender, age, location). While these aspects are still important, this traditional strategy lacks the ability to capture consumers' key preferences and develop recommendations based on prior behavioral patterns.

Consumers have higher expectations than ever before. In today's competitive markets, companies need to develop products that resonate with key audiences, stay relevant in their marketing communications, provide timely services, and emphasize customer experiences through personalization.

Indeed, the strategy of personalization has long been a key marketing strategy that provides support for enhancing customer engagement. Personalization can be implemented based on call centers, databases compiled with consumer information, and other online, digital, and mobile tools that are fostered to establish continuous contact between companies and customers. Especially in customer relationship management,

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personalization needs to be implemented on a consistent basis. The internet provided the main background for personalization strategies in marketing.

For implementing a successful personalization strategy to increase customer engagement, Artificial Intelligence (AI) provides the basis for effective marketing practices in a dynamic and data-driven business environment. Thus, AI enables marketers to move beyond segmentation and towards personalized marketing. Moreover, Generative AI reflects a new level of disruption in marketing due to its ability to expand automated marketing and content generation. As such, generative AI is projected to have an important influence in the marketing sector with a quantified impact of USD 463 billion (Chui et al., 2023).

Using machine learning and predictive analytics, AI has the ability to interpret vast amounts of data in real time. As such, AI can be used to tailor marketing messages for customers, provide recommendations for products, and interact with customers based on their prior behavior (purchases, preferences, past behavior) and/or contextual details. Due to these aspects, AI has the potential to implement effective personalized marketing strategies to increase customer engagement. Research has shown that personalized marketing impacts consumer engagement, leads to higher conversion rates, improves brand loyalty, and establishes stronger customer relationships (Lemon and Verhoef, 2016). As companies advance their efforts towards using AI in their personalization strategies, a key concern of data storage and uses arises. Companies collect, store, and utilize data about customers. Thus, customers need reassurance in terms of their secured information.

While there is an increasing body of research on AI in marketing, multiple research gaps still exist. While the potential of AI technology is recognized, there is limited conceptual frameworks that present how AI capabilities can be integrated to enhance customer engagement based on personalized marketing. As such, this paper aims to provide a structured conceptual framework that categorizes AI-driven customer engagement based on personalization.

2. Personalized Marketing for Enhancing Customer Engagement

Customer engagement is a key topic in marketing. Defined as the intensity of a consumer's cognitive, emotional and behavioral dimensions (Brodie et al., 2011; Vinerean and Opreana, 2021), consumer engagement has the potential to generate repeat purchase and higher customer lifetime value, develop brand advocacy and positive word-of-mouth (Van Doorn et al., 2010). Customer engagement is enhanced based on personalized marketing that provides the basis for better consumer-brand interactions and overall improved experiences with the organization.

Pepper & Rogers (1997) defined personalization as customizing some features of a product or service to enjoy more convenience, lower cost, or some other benefit. Pepper & Rogers, (1997) emphasized the fact that personalization can be initiated by the customer or by the firm.

Sunikka and Bragge (2012) provided a more concise definition of personalization, describing this concept as offering the appropriate product and service to the appropriate client at the appropriate time and location. From a similar perspective, Berg et al. (2001) defined personalization as a strategy designed to tailor customer interactions across all customer- facing functions like sales, marketing, and customer service.

Personalization is key in marketing, however this concept reflects an interaction with multiple domains, i.e., business, management, computer science, technology, and psychology (Chandra et al., 2022).

Chandra et al. (2022, p.1534) defined personalized marketing as "designing and delivering tailor-made products and services to individual customers". In the context of personalization, a key concept used is related to customer relationship management because personalized marketing entails understanding consumers and incorporating their preferences and requirements to adjust the marketing, with the key scope of maintaining each customer for a long-lasting relationship (Chandra et al., 2022).

For customer-centric personalized services, personalization is used interchangeably with other phrases including "individualization" (Riemer & Totz, 2001), "one-to-one marketing" (Peppers & Rogers, 1997), and "customization" (Davis, 1987).

The benefits of developing a personalization strategy are supported by evidence of increased revenue for companies. Specifically, Boudet et al. (2019) found an increase in revenue of 5 to 15% in companies that have implemented personalization in a successful manner. According to Fan and Poole (2006), personalization can be categorized considering the scope of personalization (functionality, content, interface, channel), the

audience for personalization (individual or group), and the initiator of the personalization (customer initiated or firm initiated). Tam and Ho (2006) present 3 main personalization strategies that can be incorporated in the marketing strategy:

(1) User-driven personalization: A user pre-specifies the content and style of the website that best suit his tastes and interests. User-driven customization gives the user the ability to choose the display format and information required. Personalized content is delivered to the users in their preferred format.
(2) Transaction-driven personalization: In this personalization strategy, the company decides on the content and layout the consumer interacts with. As such, the company establishes the premises of the personalization, usually based on prior transactions of the consumer and inferred preferences.

Context-driven personalization: For this strategy, an adaptive mechanism is established to customize content and layout based on consumers' preferences. Due to its high level of adaptability, the context of the interaction changes in a continuous manner. For example, a company might include dynamic ads in the profile of each consumer, considering prior interactions. This personalization strategy is noticeable on Instagram Explore tab that showcases content based on engagement history, on Netflix features that recommend shows based on prior viewing habits.

3. Overview of AI Uses in Marketing

Artificial intelligence is increasingly utilized in digital marketing as a key tool for promoting and selling goods and services with a wide range of tactics, from emails, personalized ads and recommendations, efficient selling process, customer service (Basu et al., 2024).

Successful personalization is highly dependent on insights gathered on consumers and their prior behaviors and interactions (including purchases and volumes, frequency of acquisitions, reviews, ratings…) and then using these insights into for providing adapted experiences. For these aspects, AI facilitates personalized marketing based on the exploration of consumer preferences, increased levels of targeted promotions, and enhancement of customer satisfaction (Spais and Jain, 2025).

Artificial intelligence (AI) represents a technology that enables computers to perform activities that resemble the human brain (Basu et al., 2024). In general practice, AI is used by people and businesses to perform daily tasks. Nonetheless, AI is increasingly used in marketing to comprehend consumers' decision-making patterns. As such, using AI for predictive marketing can enable companies to develop better promotional strategies (Basu et al., 2024).

In marketing, AI is focused on precision, personalization, and efficiency (Kumar et al., 2024). This technology empowers marketing efforts in order to match consumers' needs, wants, preferences while promoting long-term personalized relationships with key audiences. Based on its ability to continuously improve, AI in marketing offers key opportunities in addressing tasks that focus on consumer-brand interactions. There are a series of AI-related technologies that impact marketing and personalized marketing, such as generative AI, Machine Learning, Predictive analytics, Natural Language Processing (NLP), Recommender systems.

Generative AI

Generative AI is an example of a tool to generate content and ideas for practical implementations in marketing (Kumar et al., 2024). According to Grewal et al. (2024), generative AI (Gen AI) has the ability to create new output (i.e., text, images, videos) from existing content, based on deep learning models. Thus, Gen AI has multiple marketing opportunities. GenAI can be defined as "as deep neural networks, pre-trained on large amounts of data to create a foundation model, which is then fine-tuned to produce new content by following human instructions" (Cillo and Rubera, 2024).

Machine Learning

Furthermore, another key concept is machine learning (ML). Described as a branch of artificial intelligence (Basu et al., 2024), ML helps with the processing of large volumes of data to provide better understanding of certain patterns and big data. As such, ML is used in marketing to enable personalized interactions with the customer (Salminen et al. 2019).

Deep Learning

As a subset of machine learning, deep learning involves neural networks with many layers that allow high-level abstraction of data (Liu, 2023). In marketing, deep learning is incorporated in recommendation engines, image generation and recognition, and in complex customer segmentation developments based on large sets of behavioral data (Yu et al., 2024).

Natural Language Processing (NLP)

NLP enables the interpretation of textual and unstructured data. In the context of marketing, NLP can be used to assess customer reviews and social media interactions, providing deeper insights into consumers' perspectives. Moreover, NLP can be used to enable personalized interactions and communication through chatbots and email marketing (Basu et al., 2024).

Predictive Analytics

Predictive analytics technologies are essential in forecasting consumer behaviour, enabling marketers to establish better strategies that reflect responsiveness to consumers, and also proactively approaching consumers (Kumar et al., 2024; Haleem et al., 2022).

Programmatic advertising

Facilitated by AI, programmatic advertising has provided marketers with a key tool in automating ad buying processes, personalization and optimizing ad placements in real time, guaranteeing that ads reach the right audience at the right time (Kumar et al., 2024; Ford et al., 2023).

For programmatic advertising, a wide range of AI-related technologies are implemented, such as Natural Language Processing (NLP), Image Recognition (IR), Speech Recognition (SR), Machine Learning (ML), Natural Language Generation (NLG), and image and speech generation (Ford et al., 2023). Using this technology, businesses can develop targeted promotions by facilitating automatic ad scheduling, placement, and media planning and buying (Ford et al., 2023).

Recommender systems

Recommender systems use AI technology to analyze customer search records or purchase-related data to recommend products that are highly relevant and suit their tastes (Chang and Park, 2024). Recommender systems provide value for companies and consumers. For consumers, recommender systems provide a seamless customer experience and can impact purchase decisions and intentions. For companies, recommender systems provide useful consumer insights that enable effective marketing strategies for personalization and enhancing consumer-perceived value (Habil et al., 2023).

4. Personalized Marketing Enabled by Artificial Intelligence

Following an examination of current trends in marketing literature, this study has identified four main categories of AI-driven capabilities that have the potential to be incorporated in personalized marketing strategies with the main purpose of enhancing consumer engagement.

These categories are explored further due to their potential to transform the marketing landscape under the new technological advancements of AI. These four categories are:

1. Customer Insight Generation;
2. Content Creation, Personalization, and Campaign Optimization;
3. Customer Journey Automation and CRM Enhancement;
4. Performance Optimization and Forecasting.

4.1. Customer Insight Generation

Considering an analytic perspective, the primary focus of customer insight generation is to derive strategic marketing knowledge from consumer data, with the purpose of understanding and anticipating consumer needs. Generating customer insights is key for marketing strategy and AI can help in developing new perspectives on consumer-brand interactions to enhance customer engagement through personalized marketing. AI has the ability to process large datasets, including historical background of purchasing, browsing behaviour on websites or apps, social media interactions, adding favourite products, buying products at full-price or during promotions, and so on. Using techniques such as clustering, sentiment analysis and predictive modelling enable companies to better understand consumers. As such, AI can identify patterns of behaviour and predict future behaviours, while also creating segments of one to incorporate a personalized marketing strategy. As such, using AI to segment customers and customize services to their specific needs is now more than just a strategic choice; it is necessary (Kumar et al., 2024).

This category of customer insight generation has the potential to showcase predictive and strategic perspectives as it is focused on planning and forecasting. Key AI technologies that apply to this category include: NLP, ML, predictive analytics. For this category, Natural Language Processing (NLP) is especially useful in examining product reviews or social media posts in order to comprehend consumer sentiments.

Machine learning (ML) techniques can be utilized for customer segmentation and establishing market trends. AI customer segmentation extends marketing segmentation strategies beyond demographic and geographic aspects, to include emotions, customer feedback, product reviews, sentiments shared in different online settings (Reddy et al., 2023). Specifically, machine learning mechanisms and AI systems have the potential to optimize segmentation tactics in real-time and in dynamic and personalized framework (Kumar et al., 2024). For instance, ML can be used to develop clustering procedures to identify high-value customers or churn customers.

Furthermore, predictive analytics can be implemented for this category of consumer insights to predict churn rate and customer lifetime value (CLV) (Kumar et al., 2019; 2024).

4.2. Content Creation, Personalization, and Campaign Optimization

For this category, AI can be used to generate and personalize marketing content that adapts to individual customers and their subsequent profiles. As such, the main focus is on automation of personalized interactions in different settings of interaction or touchpoints (Gao et al., 2023; Gao and Liu, 2023). Content can be generated, personalized, and optimized to different contexts to enhance customer engagement.

Based on Generative AI and deep learning technologies, this category reflects opportunities to create personalized emails, personalized webpages in customer profiles. Moreover, recommender systems can be used to suggest specific products and contents to improve consumer experience with a particular company (Kumar et al., 2019), especially in terms of consumer satisfaction and customer engagement.

For campaign optimization, AI can be implemented for A/B testing for personalized content and assessment in real time. Additionally, dynamic ad targeting and budget spending can help optimize marketing campaigns. To this point, programmatic advertising has emerged as a transformative shift in media buying (Kumar et al., 2024) as it involves the opportunity for advertisers to reach key audiences via digital adverts (Kumar et al., 2024), across various channels. According to Kumar et al. (2024), these digital channels that are available for companies include: “display and video ads; programmatic TV advertising, which enables advertisers to detect competitor ad placements and strategically schedule their own; and digital out-of-home (DOOH), which presents dynamic ads in public spaces with real-time data adaptability”.

Based on these frameworks, companies can benefit from increased customer engagement, new revenue streams and heightened returns on marketing investments.

4.3. Customer Journey Automation and CRM Enhancement

This category reflects opportunities for automated personalized interactions in various touchpoints that improve customer experience. In today's rapidly changing environment, customers require rapid results immediate assistance and a seamless experience (Ostrom et al., 2021). This type of interactions enabled by AI enhances customer engagement and offers new levels of understanding consumers (Das et al., 2023).

Based on customer journey automation, companies can transform customer interactions based on 24/7 assistance and guidance in personalized real-time product recommendations. AI plays a key role in customer journey automation based on tools such as conversational tools, and AI-augmented CRM systems. Conversational marketing tools, such as chatbots and voice assistant provide real-time assistance.

Using chatbots, companies leverage large datasets to accommodate a two-way relationship that includes personalization and speedy solutions for digitally connected consumers (Fotheringham and Wiles, 2023). For companies, AI chatbots offer efficiency in managing customer interactions (Kumar et al., 2024) and expanding customer service capabilities.

Moreover, a new era is shown by the incorporation of AI into CRM, which utilizes big data to internalise complex consumer behaviours and empowers organisations with dynamic capabilities (Labib, 2024). AI augments CRM systems allowing brand to create automation and personalization for nurturing leads, increasing loyalty, retention, and customer engagement. In this setting, using AI-augmented CRM and personalization can increase consumers' interest for companies as organizations can deliver tailored content and follow-ups based on individual lead behaviour and preferences, enhancing the chances of acquisition (Kumar et al., 2024). Based on these frameworks, AI can help redefine customer relationships by anticipating consumer demands, adapting interactions, and optimizing customer journeys through predictive analytics.

4.4. Performance Optimization and Forecasting

AI has the potential to optimize performance based on real-time assessment and forest for future marketing strategies. To track and optimize performance in real-time, Kumar et al. (2024) propose "collecting, processing, enriching, and transforming raw data from various sources into valuable insights" that are used to establish user profiles for personalization and further consumer engagement. As such, AI assessments of data aid marketers in establishing new insights on consumer needs and preferences to personalize communication and offerings, leading to heightened satisfaction and purchase intention (van Esch et al., 2021). Using AI, organizations can also establish dynamic pricing models and mechanisms in a personalized manner for key customers and enhance their loyalty for the company, while also enhancing revenue streams.

For this category, AI technologies based on machine learning modeling are used to predict campaign performance, identify channels that are not performing in an optimal manner, and optimize budget allocation for different channels or campaigns.

Also, AI-generated forecasting based on marketing data can help organizations address conversion issues, churn rate, and the most profitable revenue streams. Predictive analytics is a pillar of this category, which prepares decision-makers with foresight and allows them to foresee trends, determine opportunities, and minimize risks (Labib, 2024). As such, AI and ML algorithms assist in efficient data processing, which enables organizations to formulate decisions.

Based on the aforementioned aspects, the identified categories support marketing strategies focused on personalization and customer engagement based on AI technology. Customer insight generation supports strategic planning. Content creation, personalization, and campaign optimization of aids organizations in their efforts of content and personalization execution. Customer journey automation and CRM enhancement helps with the automation of consumer-brand interactions. Performance Optimization and Forecasting ensures the incorporation of AI for continuous performance improvement of marketing activities.

Table 1 summarizes these proposed categories.

Table 1. AI-Driven Capabilities for Personalized Marketing and Enhanced Consumer Engagement

Category	Key scope	Examples of Marketing Applications	Key Technologies
1. Customer Insight Generation	Generating actionable insights from data (structured and unstructured)	- Sentiment analysis based on social media data and interactions - Predictive modelling - Customer segmentation	Machine Learning (ML), Natural Language Processing (NLP), Predictive Analytics
2. Content Creation, Personalization, and Campaign Optimization	Creating and adapting content marketing; Optimizing marketing campaigns in a dynamic and personalized framework	- AI-generated marketing copy - Personalized web pages - Dynamic ad targeting - Personalized email marketing - Programmatic advertising	Generative AI, Deep Learning, Recommender Systems
3. Customer Journey Automation and CRM Enhancement	Automating and personalizing interactions across multiple touchpoints.	- AI chatbots - Personalized ads - Retargeting ads - Loyalty program automation - AI-driven CRM tools	Conversational AI, CRM AI Plugins
4. Performance Optimization and Forecasting	Monitoring, predicting, evaluating and optimizing marketing performance in real-time.	- Real-time product recommendations - Dynamic pricing models - Churn prediction -A/B testing	Predictive Modeling, Recommender Systems

5. Research Opportunities for future studies

As AI reshapes marketing, there is expanding research opportunities to explore the strategic, tactical, and ethical aspects of this new era in marketing. The four identified categories have key opportunities for research. As such, future studies should focus on exploring how AI affects customer engagement in personalized frameworks, considering Customer Insight Generation, Content Creation and Campaign Personalization, Customer Journey Automation and CRM, and Performance Optimization and Forecasting.

Given this study's focus on AI's capability to enhance personalized marketing opportunities for heightened consumer engagement, we propose research opportunities related to how academic research can address the potential of AI in marketing. These research opportunities are presented in the table below.

Category	Research questions for future studies
1. Customer Insight Generation	- What forms of integration of unstructured data can increase the precision of AI-driven customer segmentation? - Why types of unstructured data can enhance customer engagement based on AI-personalization? - How can AI-derived insights enhance strategic decision-making in customer engagement and personalization? - What AI-aspects need to be considered for accurately forecasting customer lifetime value, compared to traditional frameworks? - Based on sentiment analysis, how are consumers perceiving and interacting with AI-generated marketing tactics?
2. Content Creation, Personalization, and Campaign Optimization	- What novel customer engagement strategies can firms pursue using AI? - How are AI recommendations influencing customer engagement and their overall brand experience? - What ethical considerations should be considered in AI content creation and personalization?
3. Customer Journey Automation and CRM Enhancement	- How is automation driven by AI impacting customer service? Are consumers open to the idea of chatbots? - How is conversational AI impacting customer engagement? - Which AI-automated phase of the customer journey is most likely to have positive effects on consumers' experience?

4. Performance Optimization and Forecasting	- How precisely can AI modelling of predicting performance during recessions? - Which are the most efficient and effective AI techniques and tools for optimizing a marketing campaign? Which ones predict the highest ROI levels? - How does real-time performance assessment impact marketing responsiveness? - What are the challenges and opportunities associated with dynamic pricing models for key customers?

6. Conclusion and Implications

This study highlights the transformative role of AI in marketing, highlighting its exponential expansion and opportunities for integration in marketing strategies. Specifically, our discussion centers on the AI-driven marketing capabilities in terms of enhancing customer engagement through personalized marketing, which we categorize into four main types: Customer Insight Generation, Content Creation and Campaign Personalization, Customer Journey Automation and CRM, and Performance Optimization and Forecasting.

Based on academic literature and newly implemented industry practices, this paper offers a novel framework for addressing AI in marketing strategies and tactics. As a key theoretical contribution of this study, this proposed framework of AI-driven capabilities for personalized marketing and enhanced consumer engagement focuses on mapping out the differences and interdependences between generating insights for proper marketing strategies, identifying key measures for content personalization, establishing efficient ways to create automation of customers' journey based on customized and adapted communications, optimizing performance and forecasting for future strategies. Moreover, the proposed research questions provide a structured agenda for additional studies in addressing AI for personalized marketing with regard to ethics, consumer perceptions, and practical implementation.

Considering the practical implications of the study, this proposed framework provides guidance for marketers in aligning AI investments with marketing goals based on the four proposed categories. For instance, companies might choose to prioritize predictive analytics for strategic planning or might focus on AI-driven CRM to enhance customer loyalty.

Future studies could focus on ethical considerations of AI applications in personalized marketing. As a key limitation of the present study, this paper offers conceptual perspectives. Thus, additional empirical studies are necessary to address each category based on quantitative and qualitative research.

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