A Theoretical Review on Transforming Technologies for Marketing Effectiveness

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***Abstract*—In the context of accelerated technological advancements reshaping various industries, the field of marketing is undergoing significant changes. The existing academic studies offers a limited perspective on the application of transforming technologies such as artificial intelligence, augmented and virtual reality, and analytics in marketing. This theoretical review aims to bridge this gap by providing a comprehensive analysis of the transforming technologies for marketing effectiveness increasing. Emphasising these technologies prevalence categorizing into specific groups by their functions and roles in marketing, as identified through a detailed examination of academic literature. This categorization facilitates a deeper understanding of how each technology uniquely contributes to marketing effectiveness, aligning theoretical insights with practical applications. A critical literature review of academic articles, focusing on the latest developments and applications of transforming technologies in marketing, to understand their roles and application, enhancing effectiveness of marketing activities, was performed in this research. The results present a systematic dissection of the scope and applications of these rapidly evolving technologies, providing a pivotal insight for academics and practitioners for enhancing a complex landscape of transforming technologies for marketing effectiveness increasing.**

***Keywords*—transforming technologies, marketing technologies, marketing effectiveness, theoretical review**

I. Introduction

Fluctuating customer preferences and fierce market competition have made understanding of the role and impact of transforming technologies in marketing more critical than ever (Chen & Hsu, 2023). Technologies such as artificial intelligence, augmented and virtual reality, analytics, and various other specialized technologies are rapidly evolving, significantly affecting industries, including marketing (Li & Meng, 2022; Liao & Liu, 2023). These advancements are reshaping key marketing aspects like brand awareness, customer engagement, and loyalty, and revenue generation (Linbing *et al.*, 2023; Lyu, *et al.*, 2023). Moreover, organizations face increasing pressure to stay competitive by optimizing their marketing activities and allocation of resources

Manuscript received October 25, 2023; revised December 28, 2023; accepted March 8, 2024; published September 25, 2024.

In this rapidly evolving environment, the ability to understand and effectively leverage these technologies becomes essential (Liu & Chen, 2021). By integrating transforming technologies, organizations can gain deeper insights into customer behaviour, tailor their marketing strategies more precisely, and achieve greater market penetration (Chen & Hsu, 2023). This understanding also aids in the anticipation of market trends and the alignment of marketing efforts with emerging consumer needs (Heiman *et al.*, 2020).

Despite the pressing need to understand the scope and implications of these technologies, the existing academic literature largely lacks a comprehensive, categorized analysis exploring their diverse effects on contemporary marketing practices (Gao *et al.*, 2023; Jamil *et al.*, 2022). Addressing this gap, this study examines the evolving landscape of transforming technologies in the marketing realm, categorizing them according to their prevalence in specific activities and elucidating their varying impacts on marketing strategies and results. The main goal of this research is to review the scope and impact of rapidly evolving transforming technologies in enhancing the effectiveness of contemporary marketing practices. Specifically, this study has the following objectives:

1. To provide a comprehensive analysis of transforming technologies that are shaping modern marketing, contributing to a deeper understanding of the current marketing landscape.
2. To understand the roles and influences of these technologies on contemporary marketing activities, enabling organizations to improve their marketing effectiveness.
3. To discuss the broader implications of these technologies on marketing strategies, implementation processes, and outcomes.

The structure of this article is organized as follows: first, a theoretical discussion is presented on exploration of the transforming technologies in marketing, focusing on understanding their impact on marketing effectiveness. This part includes a comprehensive literature review that highlights the rapid evolution of these technologies and their role in various business operations. Followed this, the research methodology detailed, describing the critical literature review of academic articles used to examine the

doi: 10.18178/joams.12.3.129-138

scope of transforming technologies in contemporary marketing. The study progresses through distinct research phases, each aimed to provide theoretical insights into the research problem and the research questions. Subsequently, the article presents findings aligned with specific research objectives, offering a review of implications of transforming technologies for contemporary marketing practices. Finally, article concludes the aspects on significance of evolving landscape of transforming technologies in enhancing the effectiveness of marketing activities.

II. Literature Review: Transforming Technologies for Business and Marketing

The swift evolution of transforming technologies has instigated a substantial revolution across various facets of business operations (Liu, 2022; Liu & Chen, 2021). The deployment and innovation of digital services have been instrumental in catalyzing the digital transformation that organizations across different industries are undergoing (Mo & Yang, 2022). Transforming technologies have been found to improve economic and social value, particularly in small and medium enterprises, thus increasing overall performance (Sun & Lee, 2022; Almansour, 2022). The adoption of artificial intelligence-enabled applications, big data analytics, and other advanced technologies equip organizations to renew their business practices, improve customer services, and evolve superior business models (Tian, 2022; Xu & Huwan, 2022). Recruitment of related transforming technologies equips businesses with the tools to innovate, develop new products, and elevate brand performance. This, in turn, improves overall firm performance and competitiveness in the market (Su & Yin, 2023; Ndauka & Matotola, 2023).

With the advent of digitalisation, Information Technology (IT) has facilitated the development of numerous innovative marketing tools, bringing about a digital marketing era (Fu *et al.*, 2022). These transforming technologies have invariably shaped the past and present state of marketing and hold the potential to shape its future trajectory (Peng & Li, 2023). The influence of transforming technologies on marketing has been profound in multiple aspects. They have not only improved market analytics, pricing, and channel management, but have also empowered marketers with data-driven decision-making capabilities (Phuong Dung *et al.*, 2023). Furthermore, these technologies have improved customer interaction and engagement, facilitating personalised feedback and enhancing the effectiveness and efficiency of marketing activities (Liu, 2022).

Transforming technologies have remodelled traditional processes of value creation in marketing, fostering a co-creation paradigm with customers (Eze *et al.*, 2021). Moreover, the integration of these technologies in marketing management has positively impacted various components of marketing in commercial enterprises (Han *et al.*, 2023; Gao & Zhao, 2022; Kaur, Arora & Bali, 2020). The adoption of transforming technologies in marketing activities contributes to increased effectiveness, business development, improved customer relations, and fortified brand awareness (Heiman *et al.*, 2020). Furthermore, optimization of these technologies to enhance the efficacy of marketing activities must account for several variables including attributes, sector, business size, business specifics, and objectives (Liu & Chen, 2021).

Integration of transforming technologies with marketing activities positively influences their effectiveness, business development, customer relations, and brand awareness (Gao *et al.*, 2023). The refinement of these technologies should consider various factors related to the performance of the business, market, customer and marketing departments (Fullerton *et al.*, 2019). Understanding the specific context and factors influencing the impact of transforming technologies is paramount for their successful implementation and optimization of marketing activities (Eze *et al.*, 2021).

Therefore, the main challenges facing such rapid technological integration include aligning these technologies with organizational goals, ensuring data privacy and security, adapting to regulatory changes, and managing the digital skills gap within the marketing department. These challenges necessitate a multifaceted approach that encompasses strategic planning, continuous performance monitoring, staff training, and regular updates to marketing strategies to accommodate technological advancements (Steinhoff & Palmatier, 2021).

The rapidly growing array of available transforming technologies further exacerbates these challenges. The emergent nature of this landscape means that new technologies, tools, and platforms are being introduced at unprecedented rate (Zhang *et al.*, 2023). For businesses and marketing managers, this poses a significant dilemma: not only understanding the current state of transforming technologies for marketing, but also making informative choices about which technologies to adopt (Eze *et al.*, 2021). The sheer volume and complexity of options make it increasingly difficult to discern which technologies are most aligned with specific marketing goals, how they should be implemented, and what their potential impact might be on various marketing activities (Khaled *et al.*, 2021).

Summarizing, the primary literature review has provided crucial insights into the transformative role of technologies in marketing, underscoring their significant economic and social value and their critical role in enhancing business performance and competitiveness. The integration of transformative technologies like artificial intelligence and big data analytics has marked a pivotal shift in business practices, customer services, and business model innovation. These technologies, while revolutionizing product development and brand performance, also introduce significant challenges in aligning with organizational goals, data security, regulatory adaptation, and addressing skill gaps. Moreover, the increasing variety and complexity of these technologies present dilemmas in selecting the most

appropriate for specific marketing objectives and understanding their potential impacts. This comprehensive overview not only underscores the importance of these technologies in reshaping marketing but also highlights the need for a structured exploration of their scope and impact.

III. Research Methodology

To effectively explore the scope and impact of transforming technologies in contemporary marketing, this study adopts a structured and multifaceted research methodology. At its core is a critical literature review, meticulously examining articles from the past five years that are relevant to transforming technologies in the marketing domain. This review process is integral to achieving the study's primary goal, which is to conduct an in-depth investigation into the dynamic and evolving field of marketing technologies. The methodology is deliberately designed to fulfill the main objective and to address the specific research questions and research phases, as outlined in Fig. 1, thereby ensuring a comprehensive and thorough understanding of this rapidly evolving area.

Fig. 1. Research methodology structure (created by authors).

The research methodology commences with a critical literature review, aimed at answering the first research question. This initial phase involves a detailed examination of recent academic literature on transforming technologies within marketing, with a specific focus on their latest trends and developments. The selection of literature is guided by its relevance to the core themes, which include the types of transforming technologies, their applications in marketing, and the challenges and outcomes reported in these studies.

Subsequent phases of the research are designed to address the second and third research questions. The study is structured into three distinct phases to ensure a comprehensive approach. As depicted in Fig. 1, the research process begins with the collection and study of existing literature, then moves to the organization and analytical evaluation of the data. The final phase involves integrating the findings and presenting conclusions. This structured approach enables the study to systematically dissect and analyze the wide-ranging implications of transforming technologies in marketing, ensuring depth and breadth in the investigation.

The provided research phase flow chart represents an approach of transforming technology scope for effective identification of marketing practices. It begins with a broad query about the scope of these technologies and narrows down into three specific research questions:

(1) The first research question focusses on the importance and challenges associated with the integration of transforming technologies in modern marketing. It investigates the significance of these technologies and the potential obstacles that marketing professionals might encounter during their implementation.

(2) The second research question seeks to identify which transforming technologies are currently dominant or prevalent in the field of modern marketing. This can provide insight into the most commonly adopted and impactful technologies in the industry.

(3) The third research question delves deeper into how different types of these technologies enhance the effectiveness of marketing practices. The purpose of this paper is to understand the specific contributions of various technologies to contemporary marketing methods and strategies.

In general, the sequence of questions is designed to provide a comprehensive overview, starting with the significance of transforming technologies, identifying the prevalent ones, and finally understanding their individual contributions to the marketing domain.

To conduct a critical review of the literature on transforming technologies in the field of marketing, a systematic search was performed using the Web of Science Clarivate Database. The search parameters were designed to capture a broad range of relevant academic articles published between 2018 and 2023, written in English. Keywords used for the search included a wildcard search term, "technolog*," to capture both "technologies" and "technology," along with "marketing" of the 188 initial results obtained by the Web of Science Core Collection, 54 articles were ultimately selected as the most relevant to the research area for further analysis. The distribution of publications by year indicated a surge in recent research, with 19 publications in 2022, 14 in 2023, 13 in 2021, and a lower focus in the previous years, five in 2020 and three in 2019.

This methodology applied provides a comprehensive structure of the evolving landscape of transforming technologies for increasing marketing effectiveness. The rigorous approach adopted has facilitated a critical review and categorization of transforming technologies, setting the groundwork for insightful analysis. The research findings pertinent to the research questions will be systematically unveiled, offering a narrative that articulates the practical implications of these technologies in contemporary marketing.

IV. Research Result

A. Application of Transforming Technologies in Marketing Activities

Research Question 1: What is the importance of integrating transforming technologies in modern marketing, and what obstacles do practitioners face in their implementation?

The dynamic relationship between technology and marketing has become a prominent focus in contemporary business operations. In the modern digital landscape, the use of such innovative technologies is not just a fleeting trend (Bazaras *et al.*, 2022). According to Khaled *et al.* (2021) and Steinhoff & Palmatier (2021), organisations that have effectively incorporated these technologies have observed improved marketing effectiveness, business growth, and deeper customer relationships.

The nexus between these transforming technologies and marketing has promising results. However, Su & Yin (2023) emphasise that the potential of these technologies is intricately linked to their proper application. They stress that considerations should take into account business specifics, such as attributes, sector, size, and overarching objectives. Gao & Zhao (2022) and Heiman, Ferguson & Zilberman (2020) also highlight the importance of understanding the unique contexts and factors that influence the impact of these technologies, ensuring their successful implementation and optimisation in marketing strategies.

Despite the clear advantages, integrating transformative technologies comes with its set of challenges. Goldmann & Knörzer (2023) enumerated the primary hurdles, such as aligning technologies with organisational goals, safeguarding data privacy, adapting to changing regulations, and bridging the digital skills gap within marketing teams. To address these issues, Hou *et al.* (2023) suggested a holistic approach that combines strategic planning, continuous performance assessment, and dedicated staff training.

Navigating the technological ecosystem adds another layer of complexity. As Li & Meng (2022) and Phuong Dung *et al.* (2023) indicated, the rapid emergence of new technologies often puts marketers in the thick of a bewildering tech maze. Further, Kaur *et al.* (2020) pointed out that the swift expansion of available technologies presents a challenge for businesses and marketing managers in discerning which tools to adopt. Supporting this view, Kuzior & Lobanova (2020) emphasised the dilemma of understanding the current state of transformative technologies and making informed choices regarding their implementation.

Zhang *et al.* (2022) and Trung & Thanh (2022) characterised the ongoing technological revolution in marketing as a period of boundless potential. From AI-powered tools that provide deep customer insights to augmented reality experiences that improve customer journeys, the opportunities seem limitless (Frechette *et al.*, 2023). To harness the full potential of these innovations, businesses must stay updated with the latest advancements and continually evaluate their relevance (Kaur *et al.*, 2020).

Table I presents a comprehensive summary of important academic points of view on the demand for incorporating transforming technologies into modern marketing. This table provides a brief overview of the essential duties or responsibilities that various technologies fulfil in contemporary marketing, as well as the related challenges, as explained by notable authors in the field.

TABLE I. Importance and Challenges in Technology Integration for Marketing

Category of Importance and Challenges		Function/Role Definition	Authors
Importance	Enhanced outcomes	Enhanced marketing effectiveness, business growth, deeper customer relationships.	Khaled *et al.* (2021), Steinhoff & Palmatier (2021).
	Potential of application	Proper application linked to business specifics and objectives.	Su & Yin (2023)
	Contexts & Factors	Importance of understanding unique contexts and factors for successful implementation.	Gao & Zhao (2022), Heiman, Ferguson & Zilberman (2020)
Challenges	Integration	Aligning technologies with goals, data privacy, changing regulations, and digital skills gap.	Goldmann & Knörzer (2023)
	Tech Ecosystem	Navigating emerging technologies, discerning which tools to adopt.	Li & Meng (2022), Phuong Dung *et al.* (2023), Kaur, Arora & Bali (2020), Kuzior & Lobanova (2020)
	Tech Revolution	Period of boundless potential, AI tools, augmented reality experiences.	Zhang *et al.* (2022), Trung & Thanh (2022), Frechette *et al.* (2023)

It can be stated that when effectively integrated, these technologies enhance marketing effectiveness, drive business growth, and foster deeper customer relationships. However, the realization of these benefits hinges on a nuanced understanding of business specifics and objectives, ensuring a tailored application of each technology. Despite their potential, these technologies also introduce complex challenges, such as strategic alignment, data privacy concerns, and adaptation to the rapidly evolving tech ecosystem. The findings thus highlight the necessity for businesses to strategically navigate these challenges, ensuring they effectively leverage the transformative potential of these

technologies for optimal marketing outcomes and sustained competitive advantage.

B. *Refinement of Transforming Technologies Intended to Increase the Effectiveness of Marketing Activities*

Research Question 2: What transforming technologies are currently prevalent in modern marketing?

The rapid advancement of technology has significantly transformed the field of marketing, offering new opportunities for businesses to enhance their marketing effectiveness. In this chapter, refinement of transforming technologies in various areas of marketing is performed, including data analysis tools, communication and engagement tools, operational efficiency tools, specialised marketing tools, immersive technology tools, and advanced technologies. When academic sources are examined, insights are presented into the impact and potential of these technologies in improving marketing outcomes.

The rapid evolution of technology has redefined the marketing landscape, opening up new avenues for connecting with customers and optimising business operations (Zhang *et al.*, 2022; Li *et al.*, 2022; Trung & Thanh, 2022). Understanding the breadth and impact of these transforming technologies is crucial for businesses seeking to stay competitive in a digitised world (Lyu *et al.*, 2023). Based on the literature review, this section identifies and provides and overview of various types of transforming technologies that are prevalent in marketing and contribute to enhancing the effectiveness of marketing activities. These technologies types includes:

(1) Data-Driven Insights and Analytics (tools that provide businesses with crucial data and insights for informed decision-making);
(2) Customer Engagement and Relationship Management (technologies that enhance customer interaction and foster long-term relationships;
(3) Marketing Automation and Performance Evaluation (systems that streamline marketing processes and assess their performance);
(4) Advanced Analytics and Interfaces (innovative tools that offer deeper analytical capabilities and user-friendly interfaces for marketing professionals).

The primary focus of Data-Driven Insights and Analytics group centers on tools and technologies used for the gathering, tracking, and analysing data from various digital channels. These tools provide marketers with critical insights on client behaviour, preferences, and interactions with digital material. Utilising these technologies enables companies to gain a deeper understanding of their target audience, enhance effectiveness of digital resources, and refine marketing strategies through evidence-based reasoning. These technologies provide a comprehensive perspective on the digital footprint left by clients, such as tracking website visitors and analysing video engagement. Identified technologies and tools for this group are the following:

(1) Web Analytics Tools: These provide information on website traffic patterns and customer behaviour, crucial for effective conversion optimisation (Frechette *et al.*, 2023).
(2) Email Marketing Platforms: Track performance metrics such as open rates and click-through rates for email campaigns (Mo & Yang, 2022).
(3) Mobile Analytics Tools: Focus on user engagement and app performance insights for more targeted marketing strategies on mobile devices (Yu, 2021; Eze *et al.*, 2021).
(4) SEO Tools: They track and analyse search engine rankings, vital for businesses looking to improve online visibility (Bobelyn *et al.*, 2021).
(5) Social Media Analytics Tools: Help businesses understand and refine their social media engagement levels (Eze *et al.*, 2021).
(6) Video Analytic Tools: With the increasing importance of video content in marketing, these tools provide insight into viewer behaviour and engagement (Frechette *et al.*, 2023).

Data analysis plays a crucial role in modern marketing, allowing businesses to gain valuable insight into customer behaviour, preferences, and market trends (Fu *et al.*, 2022). Hou *et al.*, (2023) highlighted the importance of using analysis and analytical tools to simplify and accelerate data collection and processing of data; Li *et al.* (2022) emphasized the use of data mining technology in precision marketing, which enables enterprises to enhance customer value and provide customised services. These data analysis tools empower marketers to make data-driven decisions and optimise their marketing strategies (Liu & Zhou, 2021).

Customer Engagement and Relationship Management group involves tools and technologies specifically developed to enhance interactions between brands and their clients. These tools are tailored to improve client experiences, increasing engagement levels and fostering enduring relationships. With a combination of automated and real-time tools, marketers can effectively address client needs, thus fostering a sense of recognition, appreciation, and attentiveness. This approach often leads to increased customer loyalty and trust. Technologies in this category, which include range from real-time chat dialogues or immersive virtual reality experiences, work to deepen the connection between the brand and the consumer. Included to this group are the following technologies and tools:

1) CRM Systems: Centralise customer interactions and data, forming the backbone for businesses to maintain meaningful relationships (Steinhoff & Palmatier, 2021).
2) Voice Analytics Tools: Measure metrics in voice campaigns, playing an integral role in assessing customer satisfaction and conversion rates (Su & Yin, 2023; Cheng *et al.*, 2021).
3) Chatbots: Facilitate real-time engagement and are increasingly used for customer service and lead generation (Kuzior & Lobanova, 2020).
4) VR/AR Platforms: Offer immersive customer experiences for marketing activities such as product demos and virtual showrooms (Frechette *et al.*, 2023).

Effective communication and engagement with customers are essential for successful marketing

campaigns (Mo & Yang, 2022). Yu (2021) and Eze *et al.* (2021) discussed various marketing communication tools and their impact on consumer attitudes, highlighting the importance of strategic coordination for greater effectiveness. Li & Meng (2022) emphasized the role of information technology in transforming marketing tools and methods, allowing more efficient communication and engagement with customers. These tools include social media platforms, email marketing, content management systems, and Customer Relationship Management (CRM) software.

Marketing Automation and Performance Evaluation encompasses technologies that focus on enhancing the effectiveness, consistency, and evaluation of marketing initiatives. Implementing automation for repetitive task and the continuously monitoring campaign effectiveness allows businesses to streamline marketing efforts for greater efficiency. These technologies support the process of making decisions based on data, enabling efficient allocation of resources and the continuous refinement of strategies based on measurable outcomes. Technologies in this category, which include capabilities for testing email designs and analysing affiliate channel performance, offer a strategic and data-oriented approach to optimize marketing activities. The following technologies and tools play a pivotal role for marketing effectiveness increasing:

(1) Marketing Automation Solutions: Automate tasks and offer real-time analytics, simplifying campaign management and evaluation (Lyu, Jia & Zhao, 2023).
(2) Affiliate Monitoring Software: Aid in tracking and assessing the performance of affiliate marketing, providing ROI insights and channel effectiveness (Chen & Hsu, 2023).
(3) A/B Testing Platforms: Enable controlled experiments on marketing assets to discern effective strategies (Chen, 2022).
(4) Marketing Performance Dashboards: Provide real-time performance insights, acting as vital tools for strategic decisions (Linbing *et al.*, 2023).
(5) Content Management Systems (CMS): Aid in digital content management, crucial for SEO and content strategies (Chang & Chen, 2022).
(6) Programmatic Advertising: Automate the ad buying process, leveraging real-time data for effective ad placements (Goldmann & Knörzer, 2023).
(7) Display Advertising Platforms: Offer robust analytical capabilities to track the performance of display ads (Kaur *et al.*, 2020).

Operational efficiency is crucial for marketing activities to run smoothly and effectively (Ndauka & Matotola, 2023). Su & Yin (2023) and Tariq *et al.*, (2020) emphasise the impact of information technology on marketing tools, enabling automation and streamlining of marketing processes (Lyu *et al.*, 2023). This includes tools for project management, workflow automation, data integration, and performance tracking (Su & Yin, 2023; Chen & Hsu, 2023). By leveraging operational effectiveness tools, marketers can optimise resource allocation, improve productivity, and improve overall marketing effectiveness.

Advanced Analytics and Interfaces represent the potential in marketing where predictive modelling meets automated, real-time customer interactions. Artificial intelligence and machine learning are integral in this context, effectively leveraging extensive datasets to generate forecasts on future patterns or behaviors. The use of AI-driven chatbots for personalised product suggestions and predictive analytics for sales trend forecasting are at the forefront of data-driven marketing. These technologies embody the merger of data analysis and forward thinking strategy, making a significant advancement in responsive marketing approaches.

(1) Artificial Intelligence (AI): Empowers businesses with advanced data analytics and customer service tools, including real-time chatbot interactions (Liu & Chen, 2021).
(2) Predictive Analytics: Use machine learning to forecast customer behavior, gaining ground in dynamic pricing and inventory planning (Mo & Yang, 2022).

The advancement of technology has brought about various featured technologies that have the potential to revolutionise marketing. Trung & Thanh (2022) explores the link between digital economy technologies and marketing in small and medium enterprises, highlighting the transformative nature of technology in marketing operations. Examples of advanced technologies include Artificial Intelligence (AI), machine learning, blockchain, and Internet of Things (IoT) (Lyu *et al.*, 2023; Tariq *et al.*, 2020; Gao & Zhao, 2022). These technologies enable marketers to automate processes, personalise marketing communications, and deliver relevant and targeted experiences to customers.

Research Question 3: How do different types of transforming technologies contribute to the effectiveness of contemporary marketing practices?

In response to Research Question 3, this section evaluates how various categories of transforming technologies contribute to the effectiveness of contemporary marketing practices. The discussion on data analysis tools by Fu *et al.*, (2022), Tian (2022), and Chen (2023) allows businesses to gain valuable insights and make data-driven decisions. Similarly, communication and engagement tools, as noted Gao & Zhao (2022), facilitate more effective interaction with customers. Operational efficiency tools, referenced by Goldmann & Knörzer (2023), streamline marketing processes, thereby improving productivity. Moreover, specialised marketing tools, as discussed by Linbing *et al.* (2023), offer unique and engaging experiences, while advanced technologies, as indicated by Fullerton, Brooksbank, & Neale (2019) open up new possibilities for automation, personalization, and targeted marketing. By leveraging these technologies, businesses can enhance their marketing effectiveness and achieve their marketing objectives (Chen, 2023; Kaur *et al.*, 2020; Liu & Chen, 2021).

The practical application and significance of these technologies are further exemplified in Table II. This table presents a concise overview of various transforming technologies, categorizing them based on their specific functionalities and roles in improving marketing operations. It demonstrates the strategic importance of each category in enhancing different aspects of marketing, thus providing a clear understanding of the classification's relevance and scientific novelty.

TABLE II. TRANSFORMING TECHNOLOGIES, THEIR FUNCTIONALITIES AND APPLICATIONS FOR MARKETING ACTIVITIES EFFECTIVENESS INCREASING

Category	Technology / Tool	Function / Role	Authors
Data-Driven Insights and Analytics	Web Analytics Tools	Insights into website traffic and customer behaviour for conversion optimisation	Frechette *et al.*, 2023
	Email Marketing Platforms	Track email campaign performance metrics like open and click-through rates	Mo & Yang, 2022
	Mobile Analytics Tools	User Engagement and App Performance Insights for Mobile Marketing	Yu, 2021; Eze *et al.*, 2021
	SEO Tools	Track and analyse search engine rankings for online visibility	Bobelyn, Claryse & Wright, 2021
	Social Media Analytics Tools	Understand and refine social media engagement levels	Eze, Chinedu-Eze, & Awa, 2021
	Video Analytic Tools	Insights into viewer behaviour and engagement for video content	Frechette *et al.*, 2023
Customer Engagement and Relationship Management	CRM Systems	Centralise customer interactions and maintain relationships	Steinhoff & Palmatier, 2021
	Voice Analytics Tools	Measure metrics in voice campaigns for customer satisfaction and conversion	Su & Yin, 2023; Cheng *et al.*, 2021
	Chatbots	Facilitate real-time engagement for customer service and lead generation	Kuzior & Lobanova, 2020
	VR/AR Platforms	Immersive customer experiences for marketing activities	Frechette *et al.*, 2023
Marketing Automation and Performance Evaluation	Marketing Automation Solutions	Automate tasks and provide real-time analytics for campaign management	Lyu, Jia, & Zhao, 2023
	Affiliate Monitoring Software	Track and assess affiliate marketing performance for ROI insights	Chen & Hsu, 2023
	A/B Testing Platforms	Controlled Experiments on Marketing Assets	Chen, 2022
	Marketing Performance Dashboards	Real-time performance insights for strategic decisions	Linbing *et al.*, 2023
	Content Management Systems (CMS)	Digital Content Management for SEO and Content Strategies	Chang & Chen, 2022
	Programmatic Advertising	Automate advertising buying by leveraging real-time data	Goldmann & Knörzer, 2023
	Display advertising platforms	Analytical capabilities to track the performance of display ads	Kaur, Arora & Bali, 2020
Advanced Analytics and Interfaces	Artificial Intelligence (AI)	Advanced data analytics and real-time chatbot interactions	Liu & Chen, 2021
	Predictive Analytics	Forecast customer behaviour for dynamic pricing and inventory planning	Mo & Yang, 2022

The categorization of transforming technologies as presented in Table II underscores their pivotal role in simplifying and coordinating multiple aspects of marketing efforts. This classification clearly indicates that while some technologies are focused on improving operational efficiency, other are geared towards enhancing consumer engagements or predictive analysis.

In summary, the discussion has highlighted the transformative impact of digitalization in marketing, compelling businesses to adapt and utilize transforming technologies. At the forefront of this transformation data-driven insights and predictive analytics are changing business engagement and deepening audience understanding. The analysis reveals the multifaced contributions of these technologies, from enhancing customer behavior analysis to automating routine marketing tasks. Their critical role in today's digital landscape emphasizes the need for organisations to demonstrate agility and innovation. Fully leveraging transforming technologies for marketing, ensure sustained competitiveness and helpful achieving comprehensive success in modern marketing practices.

V. DISCUSSIONS

The exploration of the first research question underscores the critical importance of integrating transforming technologies in modern marketing, while acknowledging the associated challenges. This study has revealed that technologies such as artificial intelligence, Customer Relationship Management (CRM) systems, and predictive analytics are not only advantageous but essential for contemporary marketing practices (Khaled *et al.*, 2021; Steinhoff & Palmatier, 2021). Their integration facilitates a deeper understanding of consumer behaviour, enhances targeting precision, and fosters innovative

customer engagement strategies. However, this integration is not devoid of challenges. The findings highlight significant hurdles such as technological unfamiliarity among marketing professionals, substantial costs involved in the installation and maintenance of advanced systems, and growing concerns about data privacy and security (Goldmann & Knörzer, 2023; Hou *et al.*, 2023). In addition, the rapid pace of technological advancement requires a continuous learning curve and adaptation for marketing teams.

In addressing the second research question, this study has illuminated a spectrum of technologies that are at the forefront of marketing advancements. The research findings underscore the significant roles of web analytics, AI-powered chatbots, CRM systems, and predictive analytics as transformative forces in the marketing domain (Frechette *et al.*, 2023; Kuzior & Lobanova, 2020). These technologies have become fundamental in the marketing landscape, primarily due to their effectiveness in executing highly accurate and targeted approaches and enabling immediate customer engagements. For example, web analytics tools provide invaluable insight into customer behaviour and traffic patterns, essential for optimising marketing strategies (Mo & Yang, 2022). Similarly, AI-powered chatbots have revolutionised customer service and engagement, offering personalised interactions in real time. Moreover, CRM systems have emerged as central to maintaining robust customer relationships, as they centralise interactions and data, forming the backbone of meaningful customer connection strategies.

The investigation into the third research question highlights the varied contributions of transforming technologies to marketing effectiveness. The study's findings elucidate that different technologies play a specialised role in enhancing various facets of marketing. For example, data analytics solutions emerge as vital for obtaining deeper customer insights. These technologies, which include a range of analytics tools, enable marketers to decipher complex customer data, transforming them into actionable insights that drive strategic decision making (Fu *et al.*, 2022; Tian, 2022). Similarly, the role of communication and engagement tools in forging stronger brand-consumer relationships is significant. Through personalised interactions and enhanced customer service, these technologies foster a sense of connection and loyalty among consumers, which is critical in today's competitive market landscape (Gao & Zhao, 2022; Eze *et al.*, 2021). Additionally, operational efficiency tools, which include systems for resource management and process optimisation, are identified as key to streamlining marketing operations (Goldmann & Knörzer, 2023; Chen & Hsu, 2023).

VI. Conclusions

This study has thoroughly analyzed the incorporation of transforming technologies in modern marketing, resulting in valuable findings. The major findings emphasize the significant influence of technology such as artificial intelligence, CRM systems, and predictive analytics on improving marketing effectiveness. These technologies have been recognized as crucial in enhancing the comprehension of client behavior, optimizing marketing processes, and facilitating data-driven decision-making.

The research highlights the various contributions of each category of transforming technology in marketing activities, ranging from data analytics to customer engagement. Implementing these technologies allows businesses to effectively employ targeted marketing strategies, optimize the allocation of resources, and cultivate robust customer connections.

Practical Implications:

(1) Strategic Integration: The results underscore the importance of businesses strategically incorporating technologies in accordance with business goals to optimize marketing effectiveness.
(2) Embracing technical Evolution: It is crucial to stay abreast of technical breakthroughs. Marketing teams must consistently enhance their understanding and adjust their strategy accordingly.

Tackling obstacles such as the disparity in digital skills and the protection of data privacy is of utmost importance. It is advisable to engage in targeted training and implement strong security measures.

(1) Utilizing analytics tools is crucial for obtaining valuable information about client preferences, optimizing marketing strategies, and expanding customer involvement in data-driven marketing.
(2) Customer Relationship Management: Enhancing the utilization of communication tools, such as chatbots powered by artificial intelligence, can greatly enhance brand-consumer connections.

Potential Areas for Future Investigation: Although this study has offered extensive insights, further research could investigate the enduring effects of these technologies on customer behavior and marketing Return on Investment (ROI). Furthermore, doing a more thorough examination of the obstacles related to incorporating new technology and identifying the most effective strategies for utilizing them in various market sectors would be highly beneficial. Research examining the ethical ramifications of artificial intelligence and data analytics in marketing could offer valuable direction for the future incorporation of technology.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Ilona Skačkauskienė and Julija Nekrošienė contributed equally to the research paper; Ilona Skačkauskienė consulted the research and was responsible for the overall conceptualization of the study; Julija Nekrošienė analyzed the data and played a key role in interpreting the results; both authors approved the final version of the paper.

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