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Urgency of digital marketing and computing management in the era of technological disruption

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ABSTRACT

The era of technological disruption has brought fundamental changes to the paradigm of modern marketing. Digital transformation requires organizations to adapt to changes in consumer behavior, technological advances, and the complexity of the global market. This conceptual article analyzes the urgency of implementing digital and computing-based marketing management in facing the business dynamics of the era of disruption. This study is based on a review of recent literature (2020–2025) that highlights the integration of cloud computing, artificial intelligence (AI), big data, and digital analytics in marketing strategies. A conceptual method is used to map the relationship between technological innovation and customer value-oriented marketing strategies. The analysis results show that the effectiveness of digital marketing management is highly dependent on the organization's capabilities in utilizing data, technology, and creativity to create personalized and relevant customer experiences. In addition, the use of computing technology strengthens business resilience through process efficiency, automation, and data-driven decision making. This article emphasizes that the ability to adapt to digital disruption is the key to organizational sustainability in the era of technology-based economy.

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1. INTRODUCTION

The development of digital technology has fundamentally changed the way organizations operate, interact with consumers, and create value (Kotler et al., 2021). Technological disruption not only creates new opportunities but also challenges conventional business models that have relied on physical interaction and traditional marketing (Bresciani et al., 2021). In the context of globalization, digitalization has given rise to cross-border competition that demands high efficiency, innovation, and flexibility (Susanti et al., 2022). Therefore, marketing management must transform from a transactional approach to an experience- and data-based approach (Chaffey & Ellis-Chadwick, 2022). This transformation emphasizes that digital technology is not merely a tool, but rather the main foundation for building competitive advantage.

The era of disruption marks a rapid shift in the adoption of technologies such as artificial intelligence (AI), cloud computing, the Internet of Things (IoT), and big data analytics (Tritama &

Tarigan, 2023). These innovations enable companies to map consumer behavior more accurately and respond to market changes (Dwivedi et al., 2021). However, technology adoption without the right managerial strategy often leads to inefficiency and failure to create added value (Raimo et al., 2023). Therefore, the urgency of digital marketing management lies not only in the use of technology but also in the ability to integrate data, creativity, and customer orientation into every strategic decision (Mariani & Wamba, 2021).

Digitalization also influences consumer behavior, which is increasingly dependent on digital media to search for information, compare products, and make purchases (Putra et al., 2024). Today's consumers expect a fast, personalized, and relevant experience at every point of digital interaction (Hollebeek & Macky, 2021). Thus, companies must build an integrated customer journey across digital platforms, social media, and other online channels (Batat, 2022). Failure to understand consumer digital behavior can lead to a loss of customer trust and loyalty.

The urgency of implementing digital marketing management is increasing in line with competitive pressures and market volatility (Nguyen et al., 2023). A study by Dwivedi et al. (2021) confirms that organizations that are able to utilize data and technology strategically tend to have higher marketing performance compared to organizations that are still conventionally oriented. However, many companies, especially MSMEs, still face barriers to digital adoption due to limited resources and technological literacy (Rahayu et al., 2024). This condition highlights a digital divide that needs to be bridged through inclusive and adaptive management strategies.

From a global perspective, technological disruption also requires organizations to build digital innovation capabilities (Matarazzo et al., 2022). This means that companies must not only adopt technology but also be able to integrate it into their long-term business strategies. Planned digital innovation can increase cost efficiency, expand markets, and strengthen customer loyalty (Raimo et al., 2023). On the other hand, failure to understand the dynamics of the digital ecosystem can cause companies to fall behind more agile and adaptive competitors (Chaffey & Ellis-Chadwick, 2022).

Based on these conditions, this study attempts to examine the urgency of digital marketing management and the use of computing in the era of technological disruption conceptually. This study focuses not only on technological aspects, but also on the managerial strategies and organizational transformations needed to adapt (Kotler et al., 2023). Using a conceptual approach based on the latest literature, this article aims to provide an in-depth understanding of the relationship between digital technology, marketing strategy, and organizational sustainability.

2. METHOD

This study uses a conceptual approach with a literature analysis method that aims to identify, synthesize, and analyze the results of recent studies relevant to the theme of digital marketing and computing management in the context of technological disruption (Snyder, 2019). The conceptual approach was chosen because it is suitable for exploring theoretical concepts and managerial practices without collecting empirical data (Whetten, 2021). The literature search was conducted through scientific databases such as Scopus, ScienceDirect, Google Scholar, and Emerald Insight using the keywords “digital marketing management,” “technological disruption,” “computational marketing,” and “AI in marketing.” Literature selection was based on relevance, novelty, and relevance to the research objectives, with publications ranging from 2020 to 2025 (Tranfield et al., 2021).

The literature analysis was carried out in three main steps, namely concept identification, theme categorization, and integration of findings (Snyder, 2020). The identification stage was carried out by selecting studies that directly discussed digital marketing transformation and the use of computational technology. Theme categorization was carried out to group the study results into several main dimensions, such as digital strategy, digital consumer behavior, data-based innovation, and organizational adaptation to technological disruption (Dwivedi et al., 2021).

The integration process was carried out by connecting these findings into a conceptual framework that explains the relationship between technology application and the effectiveness of digital marketing strategies (Raimo et al., 2023). Conceptual validity is maintained by triangulating sources through comparisons between academic literature and industry reports issued by international institutions such as McKinsey, Deloitte, and Statista (Nguyen et al., 2023). This approach allows for a more comprehensive understanding of how organizations respond to technological disruption through computational marketing innovation (Kotler et al., 2023). In addition,

this article uses an adaptive framework that combines marketing management theory, technological innovation theory, and digital transformation concepts to produce a conceptual synthesis relevant to the contemporary business context (Matarazzo et al., 2022).

3. RESULTS AND DISCUSSION

In this section, A review of the literature shows that digital marketing management has undergone significant evolution in line with developments in digital and computing technology (Dwivedi et al., 2021). This transformation has impacted not only marketing tactics, but also business models and strategic decision-making processes (Mariani & Wamba, 2021). Digitalization creates new opportunities to understand customers more deeply through big data and artificial intelligence (AI), which can predict consumer preferences and behavior (Wang et al., 2022).

The integration of marketing management and computing has resulted in a new concept known as computational marketing, where algorithms are used to optimize communication strategies and content distribution (Raimo et al., 2023). This technology enables large-scale personalization, where messages and offers are tailored to the unique needs of each customer (Chaffey & Ellis-Chadwick, 2022). A study by Nguyen et al. (2023) found that companies using computational-based predictive analytics have higher customer retention rates than companies that still rely on manual approaches.

In addition, cloud computing provides flexibility and efficiency in marketing data management (Wang et al., 2022). With this technology, marketing teams can access information in real-time and collaborate across regions with high efficiency (Matarazzo et al., 2022). This speeds up decision-making and enables organizations to respond quickly to market changes. The use of cloud marketing platforms such as HubSpot and Salesforce has also become common practice in the digital transformation of modern companies (Raimo et al., 2023).

From a strategic perspective, cloud-based digital marketing plays an important role in creating sustainable customer engagement (Hollebeek & Macky, 2021). Customer engagement is no longer built solely through promotion, but through two-way interactions reinforced by social media, chatbots, and AI-based platforms (Susanti et al., 2023). Artificial intelligence facilitates more responsive and relevant communication, strengthening long-term relationships between brands and customers (Kotler et al., 2023).

At the organizational level, the transformation towards digital marketing management requires a paradigm shift in leadership (Rahayu et al., 2024). Business leaders need to have high digital literacy to integrate marketing strategies with technological innovations (Bresciani et al., 2021). A study by Matarazzo et al. (2022) shows that digital leadership plays a significant role in determining the success of technology adoption in the marketing sector. Therefore, human resource capacity building is an integral part of the digital transformation strategy.

Another influential factor is the organization's readiness to manage big data ethically and effectively (Dwivedi et al., 2021). Inappropriate use of customer data can lead to trust and privacy issues (Nguyen et al., 2023). Therefore, organizations must comply with data governance principles and privacy policies such as the GDPR and other local regulations (Wang et al., 2022). Transparency and accountability in data management are fundamental to building long-term customer trust.

The study also shows that the integration of digital marketing and computing technology increases the effectiveness of promotional budget allocation (Raimo et al., 2023). Through data-driven marketing, organizations can accurately measure ROI, optimize distribution channels, and reduce resource waste (Kotler et al., 2023). An analytics-based approach also helps determine the most profitable market segments and design marketing campaigns that are more adaptive to changes in consumer behavior (Mariani & Wamba, 2021).

On the other hand, the main challenge in implementing computing-based digital marketing lies in the inequality of access and technological capabilities (Rahayu et al., 2024). Many small and medium-sized enterprises (SMEs) are unable to optimally utilize digital technology due to limitations in infrastructure and digital literacy (Putra et al., 2024). According to Susanti et al. (2022), an effective solution is the implementation of a digital incubation strategy through training and mentoring focused on the use of social media, e-commerce, and simple analytics.

The era of technological disruption has also brought about fundamental changes in global consumer behavior (Batat, 2022). Today's consumers are more critical, connected, and demand fast and personalized experiences (Hollebeek & Macky, 2021). Companies that are unable to provide

relevant value will lose their competitive position. In this context, computing technology serves as a tool for understanding customer behavior patterns through sentiment analysis and digital behavior mapping (Nguyen et al., 2023).

From an innovation perspective, the integration of digital marketing and computing technology creates enormous opportunities for data-driven product development (Matarazzo et al., 2022). For example, the use of AI enables the development of personalized recommendation systems that can significantly increase sales conversions (Wang et al., 2022). Data-driven innovation not only improves marketing efficiency but also strengthens an organization's ability to adapt to market demand dynamics (Kotler et al., 2023).

In the context of sustainability, the implementation of digital marketing management also supports the principles of green marketing through resource efficiency and reduction of physical promotional waste (Susanti et al., 2023). Digital campaigns enable more energy-efficient communication compared to conventional approaches such as print or billboards (Nguyen et al., 2023). This is in line with the global trend towards sustainability, which is increasingly becoming a major concern for consumers and regulators (Raimo et al., 2023).

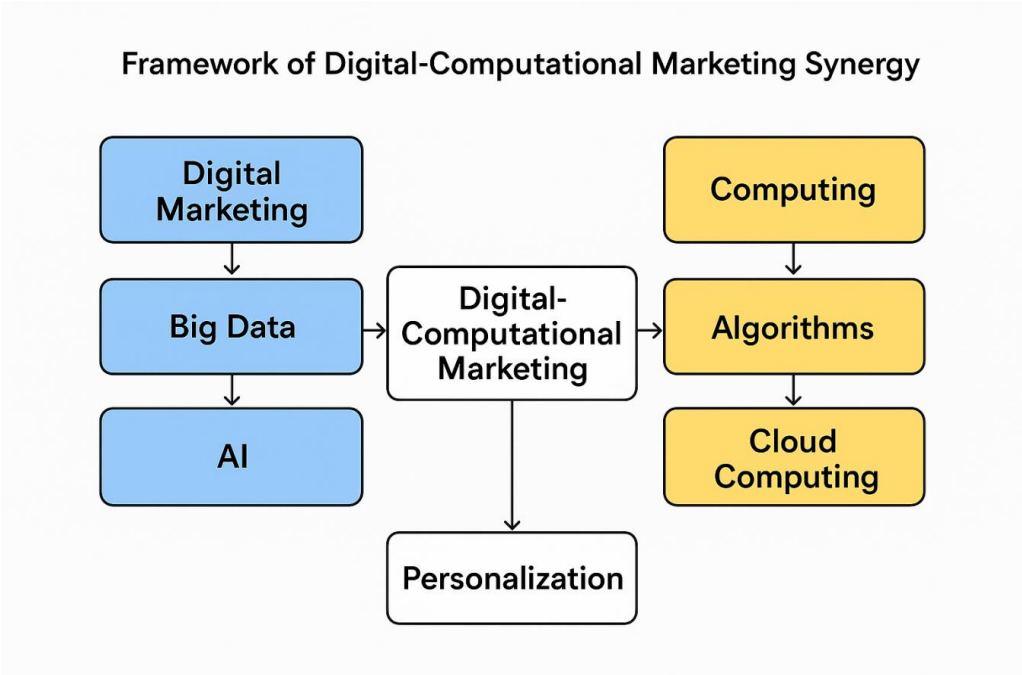
Overall, the results of the study show that the urgency of implementing digital marketing and computing management cannot be ignored by organizations that want to survive in an era of disruption (Dwivedi et al., 2021). Digitalization provides a competitive advantage through increased efficiency, innovation, and customer loyalty (Kotler et al., 2023). However, the success of digital transformation is highly dependent on the organization's readiness to manage change, build a culture of innovation, and improve the digital literacy of all stakeholders (Rahayu et al., 2024).

Thus, the urgency of digital marketing management in the era of technological disruption lies in the ability of organizations to integrate technology, people, and business strategy (Chaffey & Ellis-Chadwick, 2022). Computing serves as the main driver of transformation, while management plays a role in ensuring continuous strategic adaptation (Mariani & Wamba, 2021). This integration creates synergy between technological efficiency and human creativity, resulting in a more adaptive, innovative, and long-term value-oriented marketing system (Kotler et al., 2023).

Table 1. Summary of Key Literature on Digital Marketing Management and Computing Integration (2021–2024)

Author(s) & Year	Focus Area	Key Findings	Implications for Digital Marketing Management
Dwivedi et al. (2021)	Evolution of digital marketing	Digitalization has transformed marketing strategies and organizational processes.	Highlights the need for adaptive marketing models responsive to technological change.
Mariani & Wamba (2021)	Digital transformation in marketing	Integration of technology redefines strategic decision-making.	Encourages data-driven marketing strategies for competitive advantage.
Wang et al. (2022)	Big data and AI in marketing	Big data and AI enhance customer understanding and predictive analytics.	Enables hyper-personalization and improved consumer insight.
Raimo et al. (2023)	Computational marketing & cloud technology	Algorithms optimize marketing communication; cloud systems improve efficiency.	Strengthens marketing automation and ROI measurement.
Chaffey & Ellis-Chadwick (2022)	Personalization in digital marketing	Technology enables large-scale individualized marketing campaigns.	Promotes customer-centric marketing approaches.
Nguyen et al. (2023)	Predictive analytics & data ethics	Predictive models enhance retention but raise data privacy concerns.	Underlines the importance of ethical data governance and GDPR compliance.
Matarazzo et al. (2022)	Cloud computing & digital leadership	Cloud systems improve collaboration; leadership supports adoption success.	Emphasizes leadership’s role in digital transformation.
Hollebeek & Macky (2021)	Customer engagement via digital channels	Engagement now depends on interactive, AI-supported platforms.	Suggests focus on long-term customer relationship building.
Rahayu et al. (2024)	Digital leadership & organizational readiness	Leadership digital literacy determines transformation success.	Calls for leadership training and cultural readiness initiatives.
Bresciani et al. (2021)	Digital competency in leadership	Leaders must integrate tech literacy into marketing management.	Supports HR capacity building in digital skills.
Putra et al. (2024)	SME digital adoption	SMEs face infrastructure and literacy barriers to technology use.	Advocates for digital incubation and mentoring programs.

Author(s) & Year	Focus Area	Key Findings	Implications for Digital Marketing Management
Susanti et al. (2022; 2023)	Social media training & green marketing	Training enhances SME competitiveness; digital methods reduce waste.	Encourages sustainable, tech-based marketing practices.
Batat (2022)	Changing consumer behavior	Digital consumers demand personalization and speed.	Necessitates agile marketing systems and real-time responsiveness.
Kotler et al. (2023)	AI, innovation, and performance	AI fosters personalization, innovation, and customer loyalty.	Reinforces the strategic value of AI-driven marketing systems.
Overall Synthesis	Integration of marketing and computing	Integration improves efficiency, innovation, and adaptability.	Future success depends on combining technology, human creativity, and strategic agility.



4. CONCLUSION

The trajectory of digital marketing management in the coming years will be increasingly determined by technological acceleration, so future research needs to be directed towards a deeper understanding of the dynamics between technology, people, and organizational strategy. One important agenda is the development of studies on computational marketing, particularly related to how algorithms, machine learning, and real-time analytics shape consumer decision-making patterns and influence business strategies. Future research also needs to evaluate how algorithm-based decision-making systems can optimize efficiency without neglecting ethical aspects such as transparency, fairness, and consumer autonomy rights.

Further research also has great potential in examining digital leadership competencies. With the increasing integration of cloud computing and AI, the need to understand leadership behavior, digital mindsets, and organizational cultures that can drive technological transformation is becoming increasingly urgent. On the other hand, organizational readiness—especially among SMEs—is an area of research that needs to be elaborated through empirical studies on barriers, drivers, and models for building digital capabilities to reduce the technology gap. The aspect of sustainability adds a broad space for exploration in the digital marketing literature.Researchers can examine how environmentally friendly digital communication strategies can reduce ecological footprints and shape more responsible consumer behavior. An interdisciplinary approach combining marketing, computer science, and behavioral studies has the potential to generate new insights into digital experiences that influence long-term loyalty. Overall, future research should aim to develop an integrative

framework that unites technological innovation, human creativity, and strategic adaptability as the foundation for competitiveness in an increasingly complex digital landscape.

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