Vol. 05, No. 4 (2023) 609-616, doi: 10.24874/PES05.04.003

Proceedings on Engineering Sciences

www.pesjournal.net

APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN DIGITAL MARKETING SYSTEMS

Abdulelah Makki

Received 18.06.2023.
Accepted 02.09.2023.
UDC – 004.8:339.138

Keywords:

Artificial Intelligence, Marketing, Digital Marketing Systems, Review

A B S T R A C T

This systematic review paper provides an overview of the current literature on the application of artificial intelligence (AI) technology in digital marketing systems. The Google Scholar database was searched with the title of the paper as the keywords and additional search criteria. A total of 17 papers were shortlisted for this review. The review found that there is a high potential for AI to aid digital marketing in various ways. Some future trends towards voice search, greater automation of processes, and AI itself cannot be ruled out. Furthermore, the paper provides an overview of the current state of research on the application of AI in digital marketing systems and discusses the advantages and disadvantages of AI in this context. It also discusses the challenges and opportunities of using AI in digital marketing systems and provides recommendations for future research. This paper has implications for marketing systems.

© 2023 Published by Faculty of Engineering

1. BACKGROUND

Digital marketing is a process of promoting products and services through digital channels such as the internet, mobile phones, television, and radio. It is a form of marketing that has become increasingly popular in recent years due to its ability to reach a wide audience and its potential to generate high returns. In the past, digital marketing was limited to the use of traditional media, such as print and television advertisements. As technology has advanced, however, so too have the opportunities for digital marketing (Hassan, 2021).

The application of artificial intelligence (AI) technology in digital marketing systems has been a rapidly growing trend in recent years. AI technology has the potential to revolutionise the digital marketing landscape by providing marketers with the tools they need to better engage with their target audiences and drive conversions. AI technology can be used to automate digital marketing processes and improve the effectiveness of campaigns. For example, AI-based algorithms can be used to identify and target potential customers, optimise marketing channels, and personalise content. AI technology can also be used to track customer engagement and optimise campaigns in real time (Murgai, 2018; Hassan, 2021, Setya Gamalie 2023).

AI technology can also be used to develop creative campaigns that are tailored to specific audiences. AI

[1] Corresponding author: Abdulelah Makki
Email: akahmakki@gmail.com

technology can be used to identify trends and patterns in customer behaviour and create campaigns that are relevant to the target audience. AI technology can also be used to personalise content, create more engaging experiences, and automate marketing processes.In addition to its potential to improve the effectiveness of digital marketing campaigns, AI technology can also be used to reduce costs. AI-based solutions can automate certain processes, such as customer segmentation, which can save time and money. AI technology can also be used to analyse large amounts of data and identify trends that can be used to optimise marketing campaigns (Murgai, 2018; Hassan, 2021).

The application of AI technology in digital marketing systems has the potential to revolutionise the industry and provide marketers with unprecedented opportunities to engage with their target audiences and drive conversions. With the right implementation, AI technology can be a powerful tool for digital marketers.
This systematic review aims to assess the progress and predict the future of AI in digital marketing with the help of selected literature available on the topic.

2. METHODOLOGY & RESULTS

The Google Scholar database was used for this systematic review. The title of this research was used as the keyword. The search yielded 100 papers from the first ten pages of Google Scholar. The papers were then shortlisted for this review using the following criteria: English language papers only; full paper availability; relevance to the topic; and papers published between 2018-2021. As a result, 17 papers were shortlisted, which are reviewed below.

2.1 Reviews and general discussions

AI can be used to create content for digital marketing campaigns, reduce the costs for customer and market acquisitions, manage customer experiences, expand customer range and predict customer behaviour. Social media are the main digital marketing tools. Many examples of firms using AI for digital marketing are available. However, the use of AI, especially in marketing, is a relatively new concept for business organisations. The same is the case for research works also. However, some ethical questions like intrusions into the privacy of persons in social media also arise. Marketing professionals may use AI and digital technologies only if they can free them from mundane jobs to focus on high-value jobs (van Esch & Black, 2021).

The potential applications of AI in digital marketing were outlined by Nair and Gupta (2021). Smart content creation and curation have enhanced the extent of personalisation.Customers can be engaged using content relevant to them only. Especially in e-commerce sites like Amazon, products and services can be recommended to eachcustomer. Automated content curation with AI enhances the authority and engagement levels of the organisation to convince customers easily. Content creation is done by the collection, selection, organisation and sharing of digital information from relevant and reliable sources. Algorithms can be used for these purposes. Wordsmith and Word AI are two good examples of content creation. Voice searches using own or of others like Amazon, Apple or Google can be used for collecting digital information relevant to marketing. Voice assistants like Alexa and Google Homer are used for searching for ordering food, cabs etc. Voice-based technology can help firms to increase their leads.For media selling, methods like real-time/private/programmatic pragmatic direct media buying are used. Platforms can be sell-side or buy-side. Putting buying or selling information in ad exchanges is also done. In digital marketing, propensity modelling is useful. In propensity marketing, the targeting of customers is based on those most likely to see through a buyer's journey and convert. This method achieves media cost reduction reflecting on the ROI from the media campaign. Customer segments, which are most likely to act positively, are singled out as targets for this purpose. Potential customers who strongly indicate a tendency to be close to loyal customers are also targeted. Their conversion rates are assumed to be similar to consumers in the other segments. Propensity marketing requires the analysis of different data sets like the first-party historical data (to identify the most likely consumers to convert based on their conversion or retention rates from a previous time range; third-party data sets using third-party demographic and behavioural data overlays; andsecond-party data sets (for media targeting. to establish a relationship between lookalikes and consumer segments across digital channels). Propensity modelling can be used for predictive analysis. Dynamic pricing, marketing automation tools and dynamic emailing are widely practised AI tools for marketing by firms. The usefulness of social media in these aspects is obvious.

The benefit of using AI for digital marketing is that it facilitates the offer of superior products and services meeting or exceeding customer expectations. Understanding customer needs and sending personalised recommendations to targeted customers is a new way of digital marketing aided by AI. The term ‘digital marketing’ is applied to the use of digital technologies to acquire and retain customers, brand buildingand customer relationship management. Digital marketing is facilitated by internet technologies and mobile devices. The rapid growth of AI has contributed further to digital marketing. AI can handle a large volume of information fast, from sourcing them to analysis, interpretation and decision-making. While doing these functions, AI also learns in a variety of ways. Thus, it becomes a business capability. In very broad terms, AI helps to understand the target audience and their purchase behaviours. Learned customer behaviour can be used to personalise

content for each customer channelled through different media. Appropriate methods of content delivery arefacilitated by AI. Particular attention to the ethical aspects of all these processes is important. Offering the above background information about AI in digital marketing,Mogaji, Soetan, and Kieu (2020) discussed the issues, challenges and solutions to AI in the digital marketing of financial services. A theoretical model proposed by the authors (Fig 1) is self-explanatory.

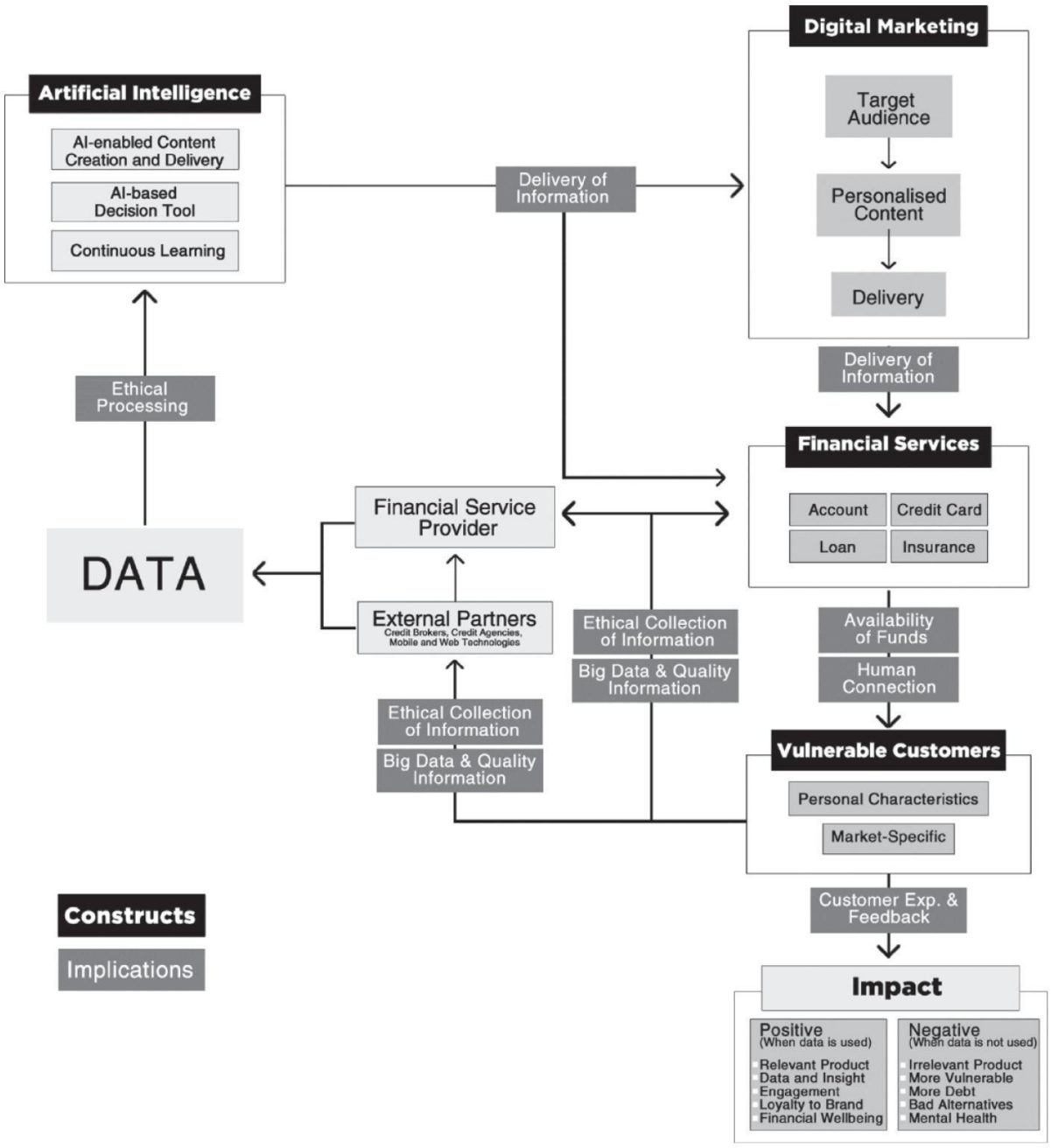

Figure 1. A Theoretical model of AI in digital financial services marketing (Mogaji, Soetan, & Kieu, 2020)

According to Theodoridis and Gkikas (2019), data mining, artificial intelligence (AI), machine learning and deep learning could complement marketing strategies.In this respect, user profiling, data classification, content optimisation, optimised targeted audiences, predictive models,and optimisation of search engine ranking factors, aided by AI, immensely benefit from providing precise results on which the marketing strategies can rely.

The research literature on the use of AI for customer relations management (CRM) in B2B marketing was reviewed by Saura, Ribeiro-Soriano, and Palacios-Marqués (2021). The review covered AI-based CRMs functionalities and characteristics consisting of analytical CRMs (purchase affinity models, potential customer leads, customer journeys, identification of the most profitable customer segments, customer affinity analysis, product portfolio adequacy, communication

automation, improved relevance and timeliness, collection of user-generated data), operational CRM (information integration and automation, interactions with other functions of the organisation, supporting the main business process, sales automation, customer information gathering, sales automation, management of customer complaints, incidents, shipment status andcollections, planning marketing, sales andcustomer service campaigns, ROI measurement), and collaborative CRM (communication customisation resources integration, knowledge of behaviour patterns of customers, provide strategic basis, alignment of information sources of all departments, establishment of two-way communication addresses). The papers collected were categorised into these four types. AI can be used for both on-premise and on-demand CRM types in multiple ways. The authors proposed a summarised diagram of their findings, as given in Fig 2.

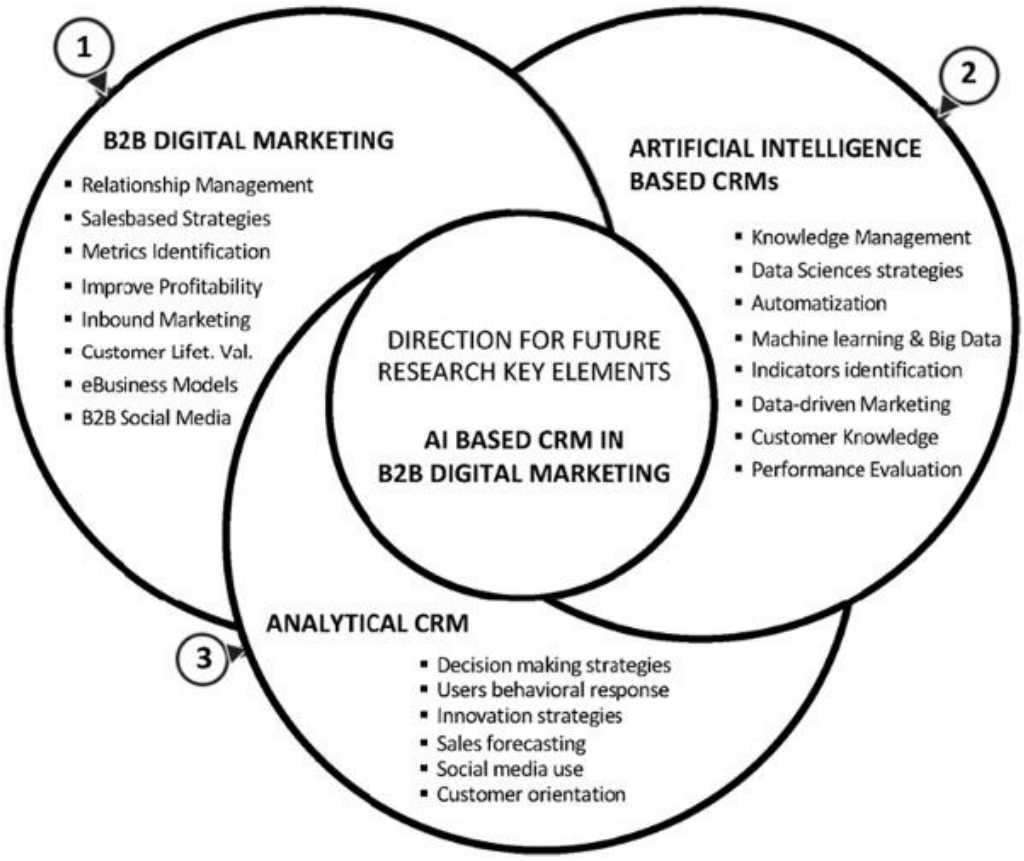

Figure 2. Summary diagram of the review findings (Saura, Ribeiro-Soriano, & Palacios-Marqués, 2021)

An AI-based online digital marketing system was designed and validated by Sufaidah and Asyari (2021). A theme marketing framework was used. The design consisted of the online website design, user menu display, registration menu, administration view, product data display, and transaction menu display.

Apart from the usual applications of AI in digital marketing described in the above-cited papers, the application of augmented reality (AR) was also discussed by Murgai (2018). AR enables the customer to see and feel the product before the online purchase.Lenskart's 3D trial is an emergingexample of this technology. It allows customers to try the frames theyliketo buy through their webcams sitting at home. Such technologies facilitate a better and faster response from the customer to reflect in the revenues.

A review by Rabby, Chimhundu, and Hassan (2021) showed that AI in digital marketing enhancescustomer experiences and influences consumer behaviour to purchase goods and services,improves operational efficiencyand service quality, andassists in building trust in digital platforms.Zeeshan and Saxena (2020)discussed automated marketing. This will change digital firms along with all the aspects of digital marketing and intelligent content marketing. In this respect, the authors discussed the uses of AI in digital marketing, its impacts on the digital market in the current situation, predictive search, and the use of social media.

The topic of AI in digital marketing was almost exhaustively reviewed by Hassan (2021). First, digital marketing was explained. Digital Marketing or Electronic marketing (e-Marketing) is a type of marketing of a specific good or service on the internet. The company displays products, and buying and selling are done through various marketing channels, both using the internet as the platform. This is because the internet is currently and a rapidly developing future important space for our daily life, being an important

source of information, almost replacing the traditional media. Methods of communication between the supplier and the customer are the only difference between digital marketing and traditional marketing. Marketing experts like Kotler recognise three types of marketing: external (outside of the organisation), internal (within the organisation) and interactive (seller-buyer interactions). The lowest cost and duration and content of promotions favour digital marketing. Instead of randomly trying to reach the maximum potential customers, as in traditional methods, digital marketing uses data from various sources to define the target customers more precisely. These advantages make it especially suitable for SMEs. Digital marketing is transmissible and interactive, has a large database and involves analysis, follow-up and control. The five types of digital marketing are email marketing, search engines, social media, advertising and through interactive advertising. However, in practice, more than one of these is combined by firms to achieve maximum benefits. The next aspect is AI. Some computers include AI software like speech recognition, deep learning, planning, and problem-solving. In daily life, the wide use of AI can be seen through social networking sites, search engines on the internet, scientific fields, smart methods, weather forecasting, and in marketing and employment. The five stages of AI development are AI capable of understanding, creating a relationship between variables, with full awareness characteristics, the independent capability of making its own decisions, and AI capable of developing itself. Examples for each stage have been given by the authors. Integration of AI into digital marketing helps in targeting practitioners and influencers, professional content development, more precise customer information, measurement of campaign performance, sales forecasting and marketing better in a shorter time. Some marketing operations that Include AI are managing customer data, analysing customer behaviour and experiences (customer journey), future customer and market analysis, analysis of potential ad campaign trends, initial marketing to analyse smart marketing efficiency and evaluate for improvements, marketing automation, analysis of data in real-time and accelerate decision-making, promotion of content marketing, the use of voice search techniques, targeted, competitive ads on the top of the Google search engine. In digital marketing, AI is used in the following ways: AI-based access platforms such as Twitter, Facebook, and other social platforms, improving marketing professionals' skills, team working to handle these platforms, automation of many processes and methods of answering frequent customer questions, automation of purchases and payments, evaluating reports from various platforms for future decision making and analysing the)AI (tools that are specifically useful for marketing professionals in the organisation. Each of these points has been discussed in detail. Some challenges of using AI in digital marketing are reaching more customers exceeding the current potential, customer retention and increasing efficiency. Some emerging trends are voice and visual search, enhancement of customer experience determining the goal to be expected, and reinforced integration to increase the complementarity between devices used by customers.

2.2 Research works

Edge Artificial Intelligence (Edge AI) is an importantcomponent of the current and futuristic Internet of Things (IoT) / Internet of Everything (IoE) environment in digital marketing. The data provided by consumers to marketers are used to improve services andprovide a personalised customer experience (CX). Edge computing can enhance security and privacy in the use, storage and processing of data. It elevates the level of the current state in these areas(Sachdev, 2020). Recognising that little work has been done on AI in the digital marketing of the Jordanian banking sector,Aladayleh (2020) provided an overview of the topic and its applicability in the banking sector with special emphasis on the Jordanian banking sector. A framework proposal is discussed without any diagram. Ruan and Siau (2019)pointed out that marketers are making useof the capabilities of AI and machine learning almost fully to predict customer behaviour,offer one-to-one digital marketing, and increase customer satisfaction, all reflecting increased sales.

According to Ullal, Hawaldar, Soni, and Nadeem (2021), the willingness to use machine learning with AI by retailers was influenced by the attitude, behaviour and choice of customers (Fig 3).A survey was conducted to yield 1250 responses (90% customers, 10% digital marketers- given in the reverse in the article as revealed by the chart) and 110 digital marketers were interviewed. The results showed that the use of competency-based deep learning would be beneficial to retailers facilitating the prediction of future purchase markets, inter-relationships between sales, number of purchases, advertisements and customer categorisation according to the destination markets, customer attitudes, The impact of AI on website interactivity and its ease of use to improve digital marketing performance were measured by Suleiman, Awan, and Javed (2021).Structured interviews were conducted using three artificial intelligence-powered websites, Amazon, Alibaba, and Uber, as references. The interview responses were grouped into different thematic headings for coding and then analysed by NVivo. The AI-empowered websites were interactive,easy to use, and couldenhance digital marketing performances. But the participants did not feel safe and secure. The findings suggest the need for more digital marketing companies to consider integrating AI capabilities into their business operations. Steps to improve the safety and security of the websites should also be taken.

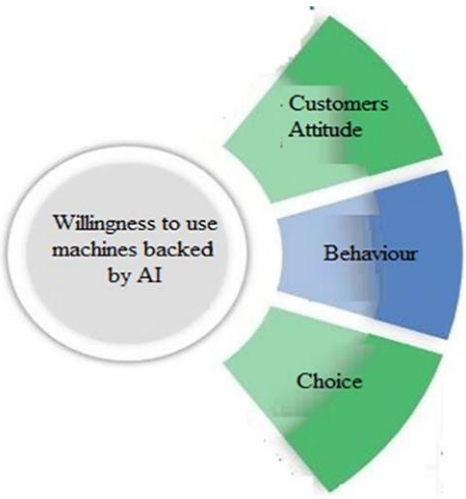

Figure 3. Customer factors affecting retailer choice of machine learning with AI (Ullal, Hawaldar, Soni, & Nadeem, 2021)

New technologies like augmented reality, virtual reality, cloud computing, big data, motion-sensing interaction, and artificial intelligence have brought new and rapid changes to talent building in digital marketing.However, problems and challenges of funding, faculty trained adequately in these methods, andslow uptake of these talents in the industry exists(Lai & Yu, 2021).

An interactive user interface for real-time prediction of potential click-through rates of composed content was proposed by Sinha, Healey, and Sengupta (2020) based on similar past campaigns. The algorithm used had a high predictive value on a historical test set (AUC .80). Digital marketing professionals were highly satisfied. Using the advice of the AI agent, up to a 22% increase in click-through rates could be generated on content from 700 A/B preference tasks given to master workers.

3. CONCLUSION

The aim of this review was to see the application of artificial intelligence technology in digital marketing systems. The above review has demonstrated the immense possibilities of digital marketing, further enhanced by AI with new capabilities integrated into it. AI technology has the potential to completely revolutionise the digital marketing industry. If used correctly, it can provide marketers with unlimited possibilities to connect with their target customers and generate higher conversion rates. AI technology can be an incredibly effective tool for those involved in digital marketing.Future development may be in the form of further enhancement of the AI capabilities, especially involving AR, VR, voice search and self-adaptation by AI for new situations. This paper has implications for marketing systems and their managers.

References:

Aladayleh, K. (2020). A framework for integration of artificial intelligence into digital marketing in Jordanian commercial banks. *Journal of Innovations in Digital Marketing, 1*(1), 32-39. doi:10.51300/jidm-2020-10

Hassan, A. (2021). The Usage of Artificial Intelligence in Digital Marketing: A Review. In A. Hamdan, A. E. Hassanien, R. Khamis, B. Alareeni, A. Razzaque, & B. Awwad (Eds.), *Applications of Artificial Intelligence in Business, Education and Healthcare* (Vols. Studies in Computational Intelligence, vol 954, pp. 357-383). Springer, Cham. doi:10.1007/978-3-030-72080-3_20

Lai, Z., & Yu, L. (2021). Research on digital marketing communication talent cultivation in the era of artificial intelligence. *Journal of Physics: Conference Series, 1757*(1), 012040. doi:10.1088/1742-6596/1757/1/012040

Mogaji, E., Soetan, T. O., & Kieu, T. A. (2020). The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers. *Australasian Marketing Journal, 29*(3). doi:10.1016/j.ausmj.2020.05.003

Murgai, A. (2018). Transforming digital marketing with artificial intelligence. *International Journal of Latest Technology in Engineering, Management & Applied Science, 7*(4), 259-262. Retrieved January 2, 2023, from https://fardapaper.ir/mohavaha/uploads/2019/09/Fardapaper-Transforming-Digital-Marketing-with-Artificial-Intelligence.pdf

Nair, K., & Gupta, R. (2021). Application of AI technology in modern digital marketing environment. *World Journal of Entrepreneurship, Management and Sustainable Development, 17*(3), 318-328. doi:https://www.researchgate.net/profile/Kiran-Nair-6/publication/349135242_Application_of_AI_technology_in_modern_digital_marketing_environment/links/607d5da72fb9097c0cf3ef20/Application-of-AI-technology-in-modern-digital-marketing-environment.pdf

Rabby, F., Chimhundu, R., & Hassan, R. (2021). Artificial intelligence in digital marketing influences consumer behaviour: A review and theoretical foundation for future research. *Academy of Marketing Studies Journal, 25*(5), 1-7. Retrieved January 2, 2023, from https://d1wqtxts1xzle7.cloudfront.net/68927976/Artificial_Intelligence_In_Digital_Marketing_Influences_Consumer_Behaviour_A_Review-libre.pdf?1630208708=&response-content-disposition=inline%3B+filename%3DARTIFICIAL_INTELLIGENCE_IN_DIGITAL_MARKE.pdf&Expires

Ruan, Z., & Siau, K. (2019). Digital marketing in the artificial intelligence and machine learning age. *AMCIS 2019 Proceedings* (pp. 1-8). AIS Electronic Library. doi:10.2139/ssrn.3405184

Sachdev, R. (2020). Towards security and privacy for edge AI in IoT/IoE based digital marketing environments. *Fifth International Conference on Fog and Mobile Edge Computing (FMEC), 20-23 April 2020, Paris, France* (pp. 341-346). IEEE. doi:10.1109/FMEC49853.2020.9144755

Saura, J. R., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2021). Setting B2B digital marketing in artificial intelligence-based CRMs: A review and directions for future research. *Industrial Marketing Management, 98*(October), 161-178. doi:10.1016/j.indmarman.2021.08.006

Setya Gamaliel, F., Nursida, N., Amalia, N., Shaddiq, S., Rudi Alhempi, R., & Supardin, L. (2023). The effect of company size and corporate governance mechanisms on profit management activities in industry 4. 0. Journal of Engineering, Management and Information Technology, 1(1), 19–26. https://doi.org/10.61552/JEMIT.2023.01.003

Sinha, M., Healey, J., & Sengupta, T. (2020). Designing with AI for digital marketing. *Adjunct Publication of the 28th ACM Conference on User Modeling, Adaptation and Personalization* (pp. 65-70). ACM. doi:10.1145/3386392.3397600

Sufaidah, S., & Asyari, T. R. (2021). Design AI In Digital Marketing (Cross Salling Method). *NEWTON: Networking and Information Technology, 1*(2), 51-56. Retrieved January 2, 2023

Suleiman, D. A., Awan, T. M., & Javed, M. (2021). Enhancing digital marketing performance through usage intention of AI-powered websites. *IAES International Journal of Artificial Intelligence, 10*(4), 810-817. doi:10.11591/ijai.v10.i4.pp810-817

Theodoridis, P. K., & Gkikas, D. C. (2019). How artificial intelligence affects digital marketing. In A. Kavoura, E. Kefallonitis, & A. Giovanis (Eds.), *Strategic Innovative Marketing and Tourism* (pp. 1319-1327). Springer, Cham. doi:10.1007/978-3-030-12453-3_151

Ullal, M. S., Hawaldar, I. T., Soni, R., & Nadeem, M. (2021). The role of machine learning in digital marketing. *Sage Open, 11*(4), 21582440211050394. doi:10.1177/21582440211050394

van Esch, P., & Black, J. S. (2021). Artificial intelligence (AI): revolutionising digital marketing. *Australasian Marketing Journal, 29*(3), 199-203. doi:10.1177/18393349211037684

Zeeshan, M., & Saxena, K. (2020). Explorative study of artificial intelligence in digital marketing. In A. Pandian, R. Palanisamy, & K. Ntalianis (Ed.), *International conference on Computer Networks, Big data and IoT.Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 49)*, pp. 968-978. Springer, Cham. doi:10.1007/978-3-030-43192-1_107

Abdulelah Makki
akahmakki@gmail.com
ORCID 0009-0000-7190-9009