

Exploring the Impact of Big Data on Social Media Marketing Practices Among Major UK Retailers

FAVOUR OLUCHI AMEDE

Department of Operations, Technology, Events and Hospitality Management, Faculty of Business and Law, Manchester Metropolitan University, Manchester, United Kingdom

Abstract- *This study explores the impact of big data analytics on social media marketing practices among major UK retailers, focusing on platforms such as Facebook, Instagram, Twitter, and YouTube. The research examines how these companies leverage big data to optimise marketing strategies, enhance customer engagement, and improve return on investment (ROI). Employing a quantitative survey methodology integrated with semi-structured interviews with marketing professionals in the tech and retail sectors, the study adopts a positivist philosophy with a deductive approach underpinned by the Technology Acceptance Model (TAM) and Diffusion of Innovations (DOI) theory. Key findings reveal a strong positive correlation ($r = 0.65$) between big data usage and customer engagement, with regression analysis showing that big data analytics explains 45% of the variance in marketing ROI ($\beta = 0.68, p < 0.001$). Case studies of ASOS, Next, and Boots demonstrate practical applications including sentiment analysis, predictive analytics, and cross-platform data integration. The study also highlights significant challenges in data privacy and ethical considerations, suggesting that future adoption of big data analytics in marketing requires a balance between technological advancement and consumer trust. Recommendations include investing in advanced analytics tools, staff training, and cultivating a data-driven culture to maintain competitiveness.*

Index Terms- — *Big Data Analytics, Customer Engagement, Return on Investment, Social Media Marketing, UK Retail*

I. INTRODUCTION

The digital marketing landscape has been fundamentally transformed over the past fifteen years with the explosion of social media. What was essentially a one-way advertising system has evolved into a two-way interactive paradigm, with platforms such as Facebook, Instagram, YouTube, and Twitter connecting billions of users globally [1]. This shift has compelled brands to move beyond broadcasting

messages to creating genuine conversations and communities with their audiences. Meanwhile, daily interactions on social media platforms generate enormous digital footprints of behavioural data that, when analysed correctly, can reveal consumer interests, opinions, and relationship patterns [2], [3].

UK retailers operate in a fast-changing environment under continuous pressure from customer demand, particularly from younger demographics whose primary mode of brand interaction is social media [4]. As data collection rises, marketers face the challenge of processing vast volumes of information effectively while carefully addressing privacy concerns [5]. This necessitates sophisticated capabilities in leveraging big data analytics for understanding audience segments and optimising marketing strategies accordingly [6].

This study aims to examine how major UK companies leverage big data analytics for optimising social media marketing strategies across Facebook, Instagram, Twitter, and YouTube. The specific objectives include: (1) analysing how UK tech and retail companies use platform user insights for social media strategies; (2) defining leading companies' approaches using consumer behaviour and demographic data; (3) exploring how brands optimise social media content with data-driven tactics; and (4) concluding best practices for UK brands to enhance social media marketing with consumer data.

II. LITERATURE REVIEW

A. Theoretical Frameworks

This study is underpinned by multiple theoretical frameworks. The Diffusion of Innovations (DOI) theory, proposed by Everett Rogers, details a framework for understanding how new technologies

are adopted and diffused in society through five critical attributes: relative advantage, compatibility, complexity, trialability, and observability [7]. In the context of big data analytics, relative advantage manifests through enhanced understanding of consumer behaviour and improved marketing campaign precision [8].

The Technology Acceptance Model (TAM) explains acceptance and use of technology based on perceived usefulness and perceived ease of use. In social media marketing, TAM helps explain how consumers' perceptions of platform usefulness and ease of use impact engagement levels and brand interaction [9], [10]. The Social Exchange Theory provides insight into brand-consumer relationships on social media, where mutual value exchange drives engagement [11]. The Theory of Planned Behavior (TPB) helps understand the cognitive processes determining consumer behavioural intentions on social media platforms [12], [13]. Finally, the Resource-Based View (RBV) positions consumer data as a strategic asset that, when leveraged through analytics, supports sustainable competitive advantage [14], [15].

B. Big Data Analytics in Social Media Marketing

Big data analytics is strategically applied to content optimisation in social media marketing. UK tech and retail companies use advanced data analytics tools to mine user behaviour and preferences, extracting insights that inform content creation [16]. Through careful analysis of sentiment trends and engagement metrics, marketers fine-tune their content for relevance and effectiveness [17]. Sentiment analysis determines the emotional tone reflected in social media posts and interactions, while engagement metrics such as likes, shares, comments, and click-through rates provide insights into how audiences interact with content [17].

C. Impact of Big Data on Marketing Outcomes

Big data analytics is an important driver of marketing outcomes in the digital era. Optimising engagement metrics is key to marketing success, as analytics reveals patterns and trends that cause meaningful engagement [18]. Additionally, big data empowers businesses with greater reach through targeted messaging by enabling marketers to target particular demographics, interests, and behaviours [19]. Real-

time measurement and optimisation enable marketers to follow key performance indicators and make data-driven adjustments on the fly [20]. Predictive analytics allows firms to anticipate new trends and changes in consumer preferences before they fully materialise in the marketplace [21].

D. Effects on ROI, Customer Retention, and Brand Loyalty

Studies show that companies utilising big data analytics in social media campaigns achieve approximately 30% higher return on investment compared to those that do not [22]. Companies using data-driven social media insights have reported a 25% uplift in customer retention rates alongside significant increases in new customer acquisition [22]. By continuously monitoring and analysing social media data, companies can act on customer feedback quickly, manage crises more effectively, and establish stronger emotional connections with consumers, thereby fostering brand loyalty [23].

E. Challenges and Ethical Considerations

Data privacy and security concerns present significant challenges to big data usage in social media marketing [24]. The regulatory environment, particularly the General Data Protection Regulation (GDPR), requires strict data handling, transparency, and prior user consent [24]. Companies must balance the usability of user insights with the rights of users over their data, implementing ethical data governance frameworks that go beyond mere compliance to build brand reputation and consumer trust [24], [25].

III. METHODOLOGY

The study adopted a positivist research philosophy with a deductive approach, employing a quantitative survey strategy supplemented by semi-structured interviews. Positivism was selected as it supports objective measurement and statistical analysis of empirical data, aligning with the study's aim of generating quantifiable and generalisable insights [26].

Data was collected through structured questionnaires distributed electronically to marketing professionals in UK tech and retail companies. The questionnaire covered demographic information, extent of big data

analytics usage, perceptions of impact on marketing outcomes, content optimisation practices, engagement metrics, and predictive analytics usage. Responses were standardised to facilitate statistical analysis [27]. Semi-structured interviews were conducted with a subset of respondents to provide qualitative depth and context to the quantitative findings.

Data analysis employed descriptive statistics (mean, median, standard deviation) for initial assessment of trends and patterns, and inferential statistics (correlation and regression analysis) for testing hypotheses about relationships between variables. Software tools including SPSS were utilised for analysis [28]. A cross-sectional time horizon was adopted to capture the current state of big data usage in social media marketing [29].

Ethical considerations included obtaining informed consent, maintaining confidentiality, GDPR compliance, and ensuring participants' right to withdraw at any time without prejudice [30].

IV. RESULTS AND FINDINGS

A. Participant Profile

Table I presents the demographic profile of the survey respondents. The majority of respondents (75%) were under 40 years of age, reflecting a young and tech-savvy sample consistent with the digital marketing industry. The gender distribution was relatively balanced at 55% male and 45% female. The high proportion of Marketing Managers (40%) and Data Analysts (25%) indicates a sample with significant expertise and decision-making authority. Company representation was distributed across small (30%), medium (35%), and large (35%) organisations [18], [22].

TABLE I: Demographic Profile of Respondents

Characteristic	Category	Frequency	Percentage
Age	20–30	–	30%
	30–40	–	45%

	40–50	–	20%
	Over 50	–	5%
Gender	Male	–	55%
	Female	–	45%
Position	Marketing Managers	–	40%
	Data Analysts	–	25%
	Social Media Strategists	–	20%
	Digital Marketing Directors	–	15%
Company Size	Small (1–50 employees)	–	30%
	Medium (51–200 employees)	–	35%
	Large (over 200 employees)	–	35%
Annual Revenue	Below £10 million	–	40%
	£10–50 million	–	35%
	Above £50 million	–	25%

B. Inferential Statistics

Table II presents the key inferential statistics from the study. The correlation analysis revealed a strong positive correlation coefficient of 0.65 between big data usage and customer engagement, indicating that companies with higher data analytics usage experience significantly better customer engagement. Regression analysis yielded a beta coefficient of 0.60 ($p < 0.01$), confirming that high usage of big data analytics predicts higher customer engagement. A second regression model showed that big data analytics explains 45% of the variance in marketing

ROI, with a beta coefficient of 0.68 ($p < 0.001$), demonstrating the substantial impact of data analytics on financial outcomes [18], [31].

TABLE II: Inferential Statistics – Big Data Usage and Marketing Outcomes

Statistical Measure	Variable Relationship	Coefficient	Significance
Correlation	Big data usage → Customer engagement	$r = 0.65$	Strong positive
Regression (Engagement)	Big data usage → Customer engagement	$\beta = 0.60$	$p < 0.01$
Regression (ROI)	Big data usage → Marketing ROI	$\beta = 0.68$	$p < 0.001$
Variance Explained (ROI)	Big data analytics → ROI	$R^2 = 0.45$	45% variance

C. Qualitative Findings: Thematic Analysis

Semi-structured interview thematic analysis identified five key themes, presented in Table III. The themes of “Enhanced Customer Insights” and “Real-Time Marketing Adjustments” were the most prominent, with respondents consistently highlighting how big data analytics enables comprehensive understanding of customer behaviours across platforms and real-time campaign modification. Content personalisation, predictive analytics, and integrated customer data emerged as further themes supporting the quantitative findings [2], [31], [32].

TABLE III: Qualitative Themes from Semi-Structured Interviews

Theme	Description	Supporting Evidence
Enhanced Customer Insights	Big data enables tracing and analysis of customer interactions across platforms	Respondents confirmed analytics provides comprehensive view of preferences and behaviours
Real-Time Marketing Adjustments	Continuous social media analytics enable real-time strategy modification	Major retailers reported running nonstop analytics to maintain campaign relevance
Content Personalisation	Data analytics helps personalise content aligned with customer interests	ASOS uses sentiment analysis to adjust content to audience mood and engagement patterns
Predictive Analytics	Historical data analysis enables forecasting of market trends and consumer demand	Next uses predictive analytics to forecast fashion trends and optimise inventory
Integrated Customer Data	Consolidation of data across platforms creates unified customer profiles	Boots integrates data from Facebook, Instagram, and Twitter for holistic personalisation

D. Case Study Insights

Table IV summarises the case study insights from three major UK retailers. ASOS employs sentiment analysis to understand customer emotions and adjust content accordingly. Next utilises predictive analytics

based on historical sales data and social media trends to forecast fashion demand and optimise inventory. Boots integrates customer data across multiple social media platforms to create unified customer profiles, enabling highly personalised marketing messages [2], [32].

TABLE IV: Case Study Summary – Big Data Applications in UK Retail

Company	Big Data Application	Strategy	Outcome
ASOS	Sentiment analysis of customer feedback and social media mentions	Content personalisation based on audience emotional tone	Enhanced engagement and content relevance
Next	Predictive analytics using past sales data and social media trends	Fashion trend forecasting and inventory optimisation	Improved demand fulfilment and reduced waste
Boots	Cross-platform customer data integration	Unified customer profiles for personalised messaging	Increased customer satisfaction and loyalty

E. Summary of Key Findings by Objective

Table V consolidates the key findings aligned to each research objective. The integration of quantitative and qualitative data provides strong cross-validated evidence that big data analytics significantly enhances customer engagement, improves marketing ROI, and enables agile real-time campaign management.

TABLE V: Summary of Key Findings by Research Objective

Research Objective	Key Finding	Evidence
Obj 1: Use of platform insights	UK retailers heavily utilise Facebook/Instagram data for marketing	ASOS and Boots confirmed using insights for customer-centric content engagement
Obj 2: Targeted messaging	Big data enables targeted promotions with enhanced ROI	$\beta = 0.68$ ($p < 0.001$); 45% variance in ROI explained by data analytics
Obj 3: Real-time analytics	Real-time data analytics is critical for campaign relevance	Interview respondents confirmed real-time adjustments keep campaigns effective
Obj 4: Best practices	Sentiment + predictive analytics improve satisfaction and loyalty	Case studies (ASOS, Next, Boots) showed measurable improvements in customer metrics

V.DISCUSSION

The findings provide substantial evidence that big data analytics significantly transforms social media marketing practices in UK tech and retail companies. The strong positive correlation ($r = 0.65$) between big data usage and customer engagement confirms findings from existing literature [18], [31]. The regression results demonstrating that big data analytics explains 45% of the variance in marketing ROI align with prior research showing that predictive analytics can drive substantial financial returns [33].

The qualitative themes and case study insights provide practical depth to the statistical findings. The consistent emphasis on real-time analytics, sentiment

analysis, and content personalisation across ASOS, Next, and Boots demonstrates that these practices are not isolated but represent emerging industry standards among leading UK retailers. These findings align with both the Technology Acceptance Model and the Diffusion of Innovations theory, confirming that perceived usefulness and observable results drive technology adoption in marketing contexts [7], [9].

The study also extends the Social Exchange Theory by demonstrating how big data deepens brand-consumer interactions through personalised content, creating stronger reciprocal relationships [11]. Furthermore, the Resource-Based View is supported by evidence that data-driven capabilities function as strategic assets enabling competitive advantage in social media marketing [14], [15].

Notably, challenges around data privacy and ethical considerations remain significant. Compliance with GDPR and the establishment of ethical data governance frameworks are essential for maintaining consumer trust while leveraging big data for marketing optimisation [24], [25].

VI. CONCLUSION

This study has demonstrated the significant impact of big data analytics on social media marketing practices among major UK retailers. The quantitative findings confirm strong positive relationships between big data usage and both customer engagement ($r = 0.65$) and marketing ROI ($\beta = 0.68$, $p < 0.001$). Qualitative analysis and case studies of ASOS, Next, and Boots provide practical evidence of how sentiment analysis, predictive analytics, and cross-platform data integration drive marketing effectiveness.

Based on these findings, the following recommendations are proposed: (1) organisations should invest in real-time analytics and sentiment analysis tools to enable agile, responsive marketing strategies; (2) integration of customer data across multiple social media platforms should be prioritised to create unified customer profiles for personalised marketing; (3) predictive analytics should be leveraged for anticipating market trends and optimising inventory and campaign planning; (4)

robust data privacy measures and ethical data governance frameworks must be established to balance marketing effectiveness with consumer trust and GDPR compliance; and (5) organisations should invest in staff training and cultivate a data-driven culture to maximise the benefits of big data analytics.

The study contributes to the literature by providing empirical evidence from the UK retail context and extending theoretical frameworks including TAM, DOI, Social Exchange Theory, and RBV. Future research should employ longitudinal designs to capture the evolving nature and long-term effects of big data analytics on marketing outcomes, and should extend the scope to other industries and geographic contexts.

ACKNOWLEDGMENT

The author extends sincere gratitude to dissertation supervisor Dr. Justin Wonjun Cho for his invaluable support, guidance, and insightful critiques throughout this research.

REFERENCES

- [1] X. Liu, H. Shin, and A. C. Burns, "Examining the impact of luxury brand's social media marketing on customer engagement: Using big data analytics and natural language processing," *Journal of Business Research*, vol. 125, pp. 815–826, 2021.
- [2] U. Sivarajah *et al.*, "Critical analysis of big data challenges and analytical methods," *Journal of Business Research*, vol. 70, pp. 263–286, 2020.
- [3] V. Jafari-Sadeghi *et al.*, "Exploring the impact of digital transformation on technology entrepreneurship," *Journal of Business Research*, vol. 124, pp. 100–111, 2021.
- [4] N. Stylos *et al.*, "Big data analytics and consumer behaviour in tourism and hospitality," 2021.
- [5] J. Abbas *et al.*, "Exploring the impact of COVID-19 on tourism: transformational potential and implications," *Current Research in Behavioral Sciences*, vol. 2, p. 100033, 2021.

- [6] S. Hussain *et al.*, “Examining the effects of celebrity trust on advertising credibility,” *Journal of Business Research*, vol. 109, pp. 472–488, 2020.
- [7] L. J. Menzli *et al.*, “Investigation of open educational resources adoption using Rogers’ diffusion of innovation theory,” *Heliyon*, vol. 8, no. 7, 2022.
- [8] A. S. Al Teneiji, T. Y. A. Salim, and Z. Riaz, “Factors impacting adoption of big data in healthcare,” *International Journal of Medical Informatics*, p. 105460, 2024.
- [9] B. Al-Ateeq *et al.*, “Big data analytics in auditing using the TAM,” *Corporate Governance and Organisational Behavior Review*, vol. 6, no. 1, pp. 64–78, 2022.
- [10] S. F. Chou *et al.*, “Identifying critical factors for sustainable marketing in catering,” *Journal of Hospitality and Tourism Management*, vol. 51, pp. 11–21, 2022.
- [11] J. V. D. S. Meira and M. Hancer, “Using the social exchange theory to explore the employee-organisation relationship,” *International Journal of Contemporary Hospitality Management*, vol. 33, no. 2, pp. 670–692, 2021.
- [12] N. Zaman *et al.*, “Trends and future perspective challenges in big data,” in *Advances in Intelligent Data Analysis and Applications*, Springer, pp. 309–325, 2021.
- [13] S. Mohr and R. Kühl, “Acceptance of artificial intelligence in German agriculture: TAM and TPB,” *Precision Agriculture*, vol. 22, no. 6, pp. 1816–1844, 2021.
- [14] S. Kamboj and S. Rana, “Big data-driven supply chain and performance: A resource-based view,” *The TQM Journal*, vol. 35, no. 1, pp. 5–23, 2023.
- [15] M. Hussain *et al.*, “Challenges of big data analytics for sustainable supply chains in healthcare: A resource-based view,” *Benchmarking: An International Journal*, 2023.
- [16] M. Holmlund *et al.*, “Customer experience management in the age of big data analytics,” *Journal of Business Research*, vol. 116, pp. 356–365, 2020.
- [17] H. Hassani *et al.*, “Text mining in big data analytics,” *Big Data and Cognitive Computing*, vol. 4, no. 1, p. 1, 2020.
- [18] X. Liu, H. Shin, and A. C. Burns, “Examining the impact of luxury brand’s social media marketing on customer engagement,” *Journal of Business Research*, vol. 125, pp. 815–826, 2021.
- [19] G. Kostygina *et al.*, “Boosting health campaign reach through social media influencers,” *Social Media + Society*, vol. 6, no. 2, 2020.
- [20] S. S. Kamble *et al.*, “A performance measurement system for industry 4.0 enabled smart manufacturing,” *International Journal of Production Economics*, vol. 229, p. 107853, 2020.
- [21] M. Naeem *et al.*, “Trends and future perspective challenges in big data,” in *Advances in Intelligent Data Analysis and Applications*, Springer, pp. 309–325, 2022.
- [22] F. Caputo *et al.*, “Over the mask of innovation management in the world of big data,” *Journal of Business Research*, vol. 119, pp. 330–338, 2020.
- [23] L. Dolega, F. Rowe, and E. Branagan, “Going digital? The impact of social media marketing on retail website traffic,” *Journal of Retailing and Consumer Services*, vol. 60, p. 102501, 2021.
- [24] W. N. Wassouf *et al.*, “Data privacy and ethical considerations in big data analytics,” 2020.
- [25] S. Bresciani *et al.*, “Using big data for co-innovation processes,” *International Journal of Information Management*, vol. 60, p. 102347, 2021.
- [26] Y. Kim, “Organisational resilience and employee work-role performance after a crisis,” *Journal of Public Relations Research*, vol. 32, no. 1–2, pp. 47–75, 2020.
- [27] J. R. Saura, D. Ribeiro-Soriano, and D. Palacios-Marqués, “Setting B2B digital marketing in AI-based CRMs,” *Industrial Marketing Management*, 2021.
- [28] R. J. Limaye *et al.*, “Social media strategies to affect vaccine acceptance: A systematic

review,” *Expert Review of Vaccines*, vol. 20, no. 8, pp. 959–973, 2021.

- [29] P. Maroufkhani *et al.*, “Big data analytics adoption: Determinants and performances among SMEs,” *International Journal of Information Management*, vol. 54, p. 102190, 2020.
- [30] D. Buhalis, D. Leung, and M. Lin, “Metaverse as a disruptive technology revolutionising tourism,” *Tourism Management*, vol. 97, p. 104724, 2023.
- [31] A. Castillo López, F. J. Llorens Montes, and J. Braojos Gómez, “Impact of social media on the firm’s knowledge exploration,” Association for Information Systems, 2021.
- [32] Y. K. Dwivedi *et al.*, “Setting the future of digital and social media marketing research,” *International Journal of Information Management*, vol. 59, p. 102168, 2021.
- [33] P. Mikalef *et al.*, “Exploring the relationship between big data analytics capability and competitive performance,” *Information & Management*, vol. 57, no. 2, p. 103169, 2020.
- [34] F. Cappa *et al.*, “Big data for creating and capturing value in the digitalised environment,” *Journal of Product Innovation Management*, vol. 38, no. 1, pp. 49–67, 2021.
- [35] P. Garg *et al.*, “Examining the relationship between social media analytics practices and business performance,” *International Journal of Information Management*, vol. 52, p. 102069, 2020.