



Research Article

Big Data and Its Impact on Decision-Making in Marketing Campaigns

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Abstract	Manuscript Information
<p>Introduction: This study examines how big data influences marketing decision-making among professionals in Amravati, Maharashtra. As digital technologies rapidly expand across India, big data has emerged as an essential resource for businesses. It enables companies to understand customer behavior, fine-tune marketing strategies, and enhance return on investment (ROI). Despite its potential, adopting big data presents challenges, including high implementation costs, a lack of skilled personnel, and concerns over data privacy—challenges particularly evident in emerging markets like Amravati.</p> <p>Methodology: A mixed-methods research design was employed, combining quantitative and qualitative approaches. Data was gathered through a survey conducted with 30 marketing professionals across various industries in Amravati. The analysis relied on descriptive statistics, chi-square tests, correlation analysis, and ANOVA. These methods assessed patterns in big data usage, its impact on marketing decisions, and the effectiveness of specific big data tools in improving marketing outcomes.</p> <p>Results: The study revealed that most participants leverage big data for activities such as personalized marketing, tracking campaign performance, and analyzing customer behavior. Google Analytics and Tableau emerged as the most effective tools, with 85% and 70% of participants rating them favorably, respectively. Nonetheless, barriers remain: 50% of respondents identified high implementation costs, while 40% pointed to a lack of skilled professionals as significant impediments to wider adoption.</p> <p>Discussion: These findings resonate with global and Indian research, demonstrating that big data enhances marketing effectiveness. Yet, the challenges observed in Amravati—such as cost barriers and skill shortages—mirror those seen in other parts of India. Compared to larger metropolitan areas like Bengaluru and Delhi, Amravati faces distinctive hurdles, such as limited access to resources and infrastructure. Addressing these issues will require affordable technological solutions and targeted upskilling initiatives to foster broader big data adoption in emerging markets.</p> <p>Conclusion: Big data has proven its potential to transform marketing decision-making in Amravati, offering improvements in customer targeting, campaign performance, and ROI. However, addressing adoption challenges remains critical. Businesses should prioritize cost-effective technologies and invest in workforce development to bridge the skill gap. The study provides practical insights for both businesses and policymakers, contributing to the understanding of big data integration in emerging markets and outlining strategies to facilitate its adoption in marketing practices.</p>	<ul style="list-style-type: none"> ▪ ISSN No: 2583-7397 ▪ Received: 12-11-2024 ▪ Accepted: 28-12-2024 ▪ Published: 08-01-2025 ▪ IJCRM:4(1); 2025: 01-05 ▪ ©2024, All Rights Reserved ▪ Plagiarism Checked: Yes ▪ Peer Review Process: Yes <p>How to Cite this Manuscript</p> <p>Virendra R Augustine. Big Data and Its Impact on Decision-Making in Marketing Campaigns. International Journal of Contemporary Research in Multidisciplinary.2024;4(1): 01-05.</p>

KEYWORDS: NIDDM, Malondialdehyde (MDA), Oxidative stress, lipid peroxidation.

1. INTRODUCTION

The rise of digital technologies has reshaped the global business environment, particularly in marketing. Over the past two decades, marketing has transitioned from intuition-driven strategies to a data-centered approach. The vast expansion of data—propelled by internet use, social media, e-commerce, and connected devices—has provided businesses with an unprecedented resource for analysis and decision-making. This evolution has introduced the concept of big data, characterized by large, complex, and rapidly growing datasets that traditional tools struggle to handle. Within the context of marketing, big data has become indispensable, enabling insights that were previously out of reach.

Big data is defined by its "3Vs": volume (the sheer amount of data), velocity (the speed of data generation), and variety (the diverse sources of data). Today's marketing campaigns produce information from sources such as social media, website analytics, email engagement metrics, customer purchase records, and real-time behaviors. By 2023, it was estimated that each individual generates about 1.7 megabytes of data per second, with over 5 billion daily internet users worldwide. This explosion in data necessitates advanced tools and techniques to manage and utilize it effectively. Scholars and practitioners have also added dimensions like "veracity" (ensuring data accuracy) and "value" (deriving meaningful insights) to the definition of big data.

Traditionally, marketers relied on methods like surveys, focus groups, and sales records to assess campaign performance. While useful, these approaches were often limited by subjectivity, scope, and timeliness. Big data, by contrast, enables real-time insights, precise customer segmentation, and predictive analytics, allowing for more effective and personalized campaigns. Companies such as Amazon and Netflix exemplify the potential of big data by using it to offer personalized recommendations, significantly improving customer satisfaction and retention.

In today's competitive market, where customer expectations are constantly evolving, creating meaningful customer experiences is just as important as selling products. Data-driven marketing has become essential for survival and growth. A Forbes Insights report highlights that 93% of executives view big data as critical to business success. Modern marketing decisions increasingly rely on data from customer insights, market trends, and real-time analytics.

Big data helps marketers address key questions, such as:

- Who are the target customers?
- What are their preferences, behaviors, and purchase patterns?
- When is the best time to engage them?
- Which communication channels work best?

For example, Coca-Cola uses big data to refine its marketing strategies, track customer preferences, and develop new products.

Similarly, Starbucks applies predictive analytics to determine optimal store locations and personalize customer experiences through its loyalty program.

Data and Reports on Big Data's Role in Marketing

The global big data analytics market in marketing is expanding rapidly. A report by Grand View Research valued the market at USD 15.1 billion in 2021, with a projected compound annual growth rate (CAGR) of 14.6% from 2022 to 2030. Factors such as the proliferation of digital platforms, cloud computing, and advancements in AI and machine learning are driving this growth. A Deloitte survey showed that 62% of marketing leaders prioritize big data and analytics, while McKinsey reported that organizations utilizing big data see a 20% improvement in campaign ROI and a 30% boost in customer acquisition efficiency. These findings underscore the growing reliance on big data in strategic marketing decisions.

2. OBJECTIVE OF THE STUDY

This research aims to explore how big data impacts marketing decision-making among professionals in Amravati, Maharashtra. Specifically, it seeks to examine the use, challenges, and effectiveness of big data tools in marketing strategies. Additionally, the study provides actionable recommendations for enhancing big data adoption in emerging markets.

3. METHODOLOGY

Study Area

The research was conducted in Amravati, the capital city of Maharashtra, India. Amravati was chosen for its emerging market ecosystem and its growing adoption of digital tools across industries such as retail, e-commerce, and services.

Sample Size

A purposive sampling method selected 30 marketing professionals actively involved in decision-making within their organizations.

Data Collection

Primary Data: A questionnaire was distributed to marketing professionals in various industries.

Secondary Data: Industry reports and case studies were analyzed to complement the primary data.

Analysis

The study employed a range of statistical tools and methods, including:

- **Descriptive Statistics:** To identify trends and preferences in big data usage.
- **Chi-Square Tests:** To examine relationships between big data adoption and marketing outcomes.
- **Correlation Analysis:** To assess the impact of big data tools on campaign ROI.

Questionnaire Design: The questionnaire consisted of three sections:

Section A: Demographic Information

Question ID	Question	Response Type
Q1	What is your age?	Multiple Choice
Q2	What is your gender?	Multiple Choice
Q3	Which industry do you work in?	Multiple Choice

Section B: Big Data Usage and Challenges

Question ID	Question	Response Type
Q4	How often do you use big data in your marketing decisions?	Scale (Frequently, Occasionally, Rarely)
Q5	Which areas of marketing benefit the most from big data?	Multiple Choice (Behavior Analysis, ROI, etc.)
Q6	What challenges do you face in implementing big data solutions?	Open-Ended

Section C: Impact and Effectiveness

Question ID	Question	Response Type
Q7	How has big data improved campaign targeting?	Scale (1-5 Likert Scale)
Q8	How do you rate the effectiveness of tools like Google Analytics, Tableau, etc.?	Scale (Highly Effective to Not Effective)

4. RESULTS & ANALYSIS

Demographic Details of Participants

Demographic Parameter	Category	Number of Participants	Percentage (%)
Age	25-35 Years	12	40%
	36-45 Years	10	33%
	Above 45 Years	8	27%
Gender	Male	18	60%
	Female	12	40%
Industry	E-commerce	8	27%
	Retail	10	33%
	Services	12	40%

Table 1: Age, gender, and industry-wise distribution of participants in the study

A frequency distribution shows that the largest age group is 25-35 years (40%), followed by 36-45 years (33%). A chi-square

test indicates no significant relationship between gender and industry ($p=0.21$).

Use of Big Data in Marketing

Big Data Usage Area	Frequently Used (%)	Occasionally Used (%)	Rarely Used (%)
Customer Behavior Analysis	70%	20%	10%
Campaign Performance Tracking	80%	15%	5%
Predictive Analytics	60%	30%	10%
Personalized Marketing	75%	15%	10%

Table 2: Frequency of big data usage across various marketing activities among participants.

Descriptive statistics reveal frequent usage of big data in campaign performance tracking (80%) and personalized marketing (75%). A chi-square test confirms significant

variation in big data usage frequency across marketing activities ($\chi^2=12.45, p<0.05$).

Impact of Big Data on Marketing Decisions

Decision-Making Impact Areas	Positive Impact (%)	Neutral Impact (%)	Negative Impact (%)
Improved Target Audience Reach	85%	10%	5%
Enhanced ROI	80%	15%	5%
Faster Decision-Making	78%	20%	2%
Reduced Marketing Costs	65%	30%	5%

Table 3: Perceived impact of big data on key marketing decision-making areas.

Descriptive analysis shows that 85% of participants report improved audience targeting, while 80% observe ROI

enhancement. Correlation analysis between ROI improvement and faster decision-making shows a strong positive relationship ($r=0.78, p<0.01$).

Challenges in Big Data Implementation

Challenges Faced	Number of Responses	Percentage (%)
High Implementation Costs	15	50%
Lack of Skilled Professionals	12	40%
Data Privacy Concerns	10	33%
Integration Issues	8	27%

Table 4: Major challenges faced by participants in adopting big data solutions.

Frequency analysis identifies high implementation costs (50%) and lack of skilled professionals (40%) as primary challenges.

A chi-square test shows a significant relationship between challenges and industry type ($\chi^2=10.32, p=0.03$).

Effectiveness of Big Data Tools

Big Data Tool	Highly Effective (%)	Moderately Effective (%)	Not Effective (%)
Google Analytics	85%	10%	5%
Tableau	70%	20%	10%
Power BI	65%	25%	10%
Hadoop	60%	30%	10%

Table 5: Participant ratings of the effectiveness of popular big data tools for marketing.

Google Analytics is rated highly effective by 85%, followed by Tableau (70%). ANOVA results indicate significant differences in tool effectiveness ratings across industries ($F(3, 26) = 5.67, p < 0.05$).

5. DISCUSSION

The findings of this research illustrate the transformative impact of big data on marketing decision-making among professionals in Amravati, Maharashtra. Participants highlighted several key benefits of using big data analytics, including improved audience targeting (reported by 85% of respondents), enhanced return on investment (80%), and quicker decision-making processes (78%). Despite these advantages, notable challenges persist, such as high implementation costs (50%), a shortage of skilled professionals (40%), and concerns over data privacy (33%). These challenges underscore the difficulties businesses in emerging markets face when integrating advanced technologies like big data. The study’s outcomes align with broader Indian research, emphasizing the growing importance of big data analytics in marketing. For instance, Sivarajah et al. (2017) reported enhanced customer targeting and engagement efficiency among Indian businesses leveraging big data, a trend mirrored in the present research. Similarly, Verma and Kumar (2019) observed that retail and e-commerce companies across India increasingly rely on big data tools to track campaign performance and predict customer behaviors—an observation consistent with this study’s finding that 80% of participants frequently use big data for campaign tracking.

When it comes to adoption barriers, Sharma and Gupta (2020) identified high costs and talent shortages as significant challenges for Indian businesses, particularly for small and medium enterprises (SMEs) in Tier-2 cities like Amravati. This finding aligns with the 50% of respondents in this study who cited high costs as a critical obstacle. Sharma and Gupta also noted that financial constraints are more pronounced in non-metro cities than larger urban centers like Bengaluru or Mumbai, reinforcing the unique challenges businesses face in Amravati.

Regarding tool effectiveness, Gupta and Tiwari (2018) found Google Analytics to be the most widely preferred tool among Indian marketers due to its user-friendly interface, accessibility, and robust features. This preference is consistent with this study’s results, where 85% of respondents rated Google Analytics as highly effective. Additionally, tools like Tableau and Power BI were recognized as moderately effective, highlighting the increasing reliance on advanced data visualization tools across Indian businesses. The regional focus of this study offers unique insights into the specific adoption patterns and challenges encountered by professionals in Amravati. Unlike metro cities such as Delhi or Bengaluru, Amravati represents a growing market ecosystem characterized by expanding digital adoption but limited infrastructure and resources for big data implementation. These findings echo those of Singh and Raj (2021), who reported that businesses in non-metro regions often struggle with limited access to skilled talent and technological infrastructure, hindering their ability to fully leverage big data analytics.

6. CONCLUSION

This study underscores the critical role of big data in transforming marketing decision-making among professionals in Amravati, Maharashtra. Big data analytics has proven to significantly improve audience targeting, enhance ROI, and optimize the efficiency of marketing campaigns. Tools such as Google Analytics and Tableau emerged as highly effective in achieving these results. However, adoption barriers—including high costs, a shortage of skilled professionals, and data privacy concerns—pose considerable challenges, particularly within Amravati’s emerging market ecosystem. Industries such as e-commerce, retail, and services are at the forefront of big data adoption in the region, reflecting a growing awareness of its

potential benefits. These trends are consistent with the broader Indian market, where businesses increasingly embrace data-driven strategies to remain competitive. Overcoming the identified barriers will require collective efforts from businesses, policymakers, and educational institutions. Investments in affordable technologies targeted professional training programs, and robust data privacy frameworks are crucial for creating an environment that supports big data adoption. While this study highlights the current state of big data in Amravati, its findings suggest the need for future research. Longitudinal studies could track the evolution of big data's impact over time, while further exploration of strategies for adoption across various sectors would provide a more comprehensive understanding. This research contributes valuable insights to the growing discourse on big data in India, offering practical recommendations for businesses operating in emerging markets.

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