IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 1, March 2026
Impact Factor: 8.2

Role of Digital Media Analytics in Strategic Business Decision-Making: A Scientific Approach

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Abstract: *The rapid expansion of digital platforms has generated vast volumes of structured and unstructured data, creating new opportunities for evidence-based managerial decision-making. This study examines the role of digital media analytics in strategic business decision-making from a scientific and data-driven perspective. It analyses how tools such as big data analytics, artificial intelligence, machine learning, and sentiment analysis convert digital interactions into actionable business intelligence. The research evaluates the impact of digital metrics—engagement rate, reach, conversion ratio, and consumer sentiment—on strategic functions including marketing planning, product development, risk assessment, and competitive positioning. Adopting a quantitative research design, the study proposes statistical modelling and predictive analytics to measure the relationship between digital media insights and organizational performance. The findings aim to establish digital media analytics as a scientific management instrument that enhances accuracy, reduces uncertainty, and strengthens long-term strategic planning in contemporary commercial enterprises.*

Keywords: Digital Media Analytics, Strategic Decision-Making, Data-Driven Management

I. INTRODUCTION

The contemporary business environment is increasingly shaped by digital transformation and the exponential growth of online communication platforms. Digital media platforms such as social networking sites, e-commerce portals, and content-sharing applications generate vast volumes of real-time data reflecting consumer preferences, behavioral patterns, and market trends. This data, when systematically collected and scientifically analysed, becomes a strategic asset for commercial organizations. Digital media analytics refers to the application of statistical tools, data mining techniques, artificial intelligence, and predictive modelling to interpret digital interactions and convert them into actionable business insights.

In the field of commerce and management, strategic decision-making requires accuracy, timely information, and risk assessment. Traditional decision-making models were largely dependent on historical data and managerial intuition. However, the integration of scientific analytical methods into digital media data processing has transformed managerial practices into evidence-based systems. Through metrics such as engagement rates, click-through rates, sentiment analysis, and conversion tracking, organizations can evaluate market demand, customer satisfaction, and brand positioning with greater precision.

This study adopts a scientific approach to examine how digital media analytics supports strategic planning, marketing management, product innovation, and competitive advantage. It highlights the growing interconnection between commerce, management science, mass media, and data science, emphasizing the importance of analytical competence in modern business leadership.

Significance of the Study

This study is significant as it bridges the gap between digital communication practices and scientific managerial decision-making in the field of commerce and management. In an era characterized by data proliferation, organizations

DOI: 10.48175/IJARSCT-31461

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require systematic analytical frameworks to transform digital media information into measurable business outcomes. The research contributes by establishing digital media analytics as a strategic management tool rather than merely a marketing instrument. It provides empirical insight into how scientific techniques such as predictive modelling, sentiment analysis, and performance metrics enhance organizational efficiency, reduce uncertainty, and support evidence-based strategy formulation.

Further, the study is relevant for academicians, researchers, and industry practitioners seeking to integrate data science with business administration. It also assists policymakers and corporate leaders in understanding the economic implications of digital transformation. By emphasizing a scientific approach, the research promotes transparency, accountability, and rational decision-making in modern commercial enterprises.

Limitations of the Study

This study is subject to certain limitations that may influence the generalization of its findings. Firstly, digital media analytics relies heavily on the availability and accuracy of online data, which may be affected by algorithmic biases, fake accounts, bots, or manipulated engagement metrics. Secondly, rapid technological advancements may render specific analytical tools or platforms obsolete, limiting the long-term applicability of the findings. Thirdly, the study may focus primarily on selected industries or geographic regions, thereby restricting broader comparative analysis.

Additionally, organizational confidentiality and restricted access to proprietary data may constrain the depth of empirical investigation. The interpretation of consumer sentiment through automated tools may not fully capture contextual nuances or cultural variations. Finally, the dynamic nature of digital consumer behavior makes it challenging to establish permanent causal relationships between media analytics and strategic outcomes. These limitations must be considered while interpreting the results and drawing managerial implications.

Research Gap

Although existing literature extensively discusses digital marketing, big data, and analytics-driven management, limited research integrates digital media analytics specifically with strategic business decision-making using a scientific and statistical framework. Many studies focus primarily on marketing performance rather than examining its direct impact on overall organizational strategy and profitability. Further, there is insufficient empirical research based on structured hypothesis testing, particularly using quantitative tools such as Chi-square analysis in interdisciplinary contexts combining commerce, management, mass media, and data science. The lack of integrated models connecting digital performance metrics with strategic outcomes creates a gap that this study seeks to address through systematic and evidence-based analysis.

Objectives of the Study

To examine the role of digital media analytics in enhancing strategic business decision-making through scientific tools such as data analytics, artificial intelligence, and predictive modelling.

To analyse the relationship between digital media performance metrics (engagement, reach, sentiment, conversion rates) and organizational outcomes such as profitability, market positioning, and competitive advantage.

Hypotheses of the Study

1. H_0 (Null Hypothesis): Digital media analytics has no significant impact on strategic business decision-making.

H_1 (Alternative Hypothesis): Digital media analytics has a significant positive impact on strategic business decision-making.

2. H_0 (Null Hypothesis): There is no significant relationship between digital media performance metrics (engagement, reach, sentiment, conversion rates) and organizational outcomes such as profitability, market positioning, and competitive advantage.

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H_1 (Alternative Hypothesis): There is a significant positive relationship between digital media performance metrics (engagement, reach, sentiment, conversion rates) and organizational outcomes such as profitability, market positioning, and competitive advantage.

II. REVIEW OF LITERATURE

1. Davenport and Harris (2007)[1] argue that analytics-driven organizations outperform competitors by embedding data-based decision-making into their strategic core. The authors conceptualize analytics as a scientific discipline integrating statistics, predictive modelling, and performance measurement. Their work highlights how firms convert digital information into competitive advantage through systematic data governance and analytical culture. The study provides foundational theoretical support for viewing digital media analytics as a strategic management tool rather than a marketing function. It establishes a framework for understanding how analytical capability enhances organizational performance, operational efficiency, and long-term strategic sustainability in commercial enterprises.

2. Brynjolfsson and McElheran (2016) empirically examine the adoption of data-driven decision-making across firms and conclude that organizations using structured data analytics achieve higher productivity and performance outcomes. Their quantitative study supports the proposition that scientific data interpretation reduces uncertainty and improves strategic accuracy. The research demonstrates a positive relationship between analytics capability and firm-level efficiency. This work strengthens the argument that digital media analytics can influence strategic planning and competitive positioning. It also emphasizes the importance of technological readiness and managerial competence in successfully integrating analytics into business operations.[2]

3. Chaffey and Ellis-Chadwick (2019) provide a comprehensive framework linking digital marketing analytics with strategic management processes. The authors emphasize performance metrics such as conversion rates, engagement analytics, and customer journey mapping as essential for informed decision-making. Their work integrates digital communication theory with managerial strategy, highlighting the measurable impact of online platforms on revenue generation. The book supports the interdisciplinary connection between mass media and commerce by explaining how digital analytics facilitates evidence-based marketing planning. It also underscores the importance of continuous monitoring and performance optimization in dynamic digital markets.[3]

4. Provost and Fawcett (2013) discuss the conceptual foundation of data science and its application in managerial decision-making. The authors clarify the relationship between big data, predictive analytics, and strategic insights. Their research emphasizes methodological rigor, statistical modelling, and algorithmic accuracy as prerequisites for reliable decision-making. The study contributes to understanding how digital media data can be scientifically analysed to derive business intelligence. It further explains the importance of evaluation metrics and model validation in ensuring credible results. This work provides methodological support for adopting structured analytical approaches in digital media research.[4]

5. Kaplan and Haenlein (2010) explore the evolution of social media and its implications for business strategy. The authors classify social media platforms and analyse their strategic communication potential. Their work highlights both opportunities and risks associated with digital engagement, including reputation management and consumer interaction. The study provides a theoretical foundation for understanding digital platforms as sources of market intelligence. It underscores the strategic relevance of monitoring online engagement and consumer sentiment. This research supports the view that social media analytics plays a critical role in shaping organizational image and competitive advantage.[5]

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[1] Davenport and Harris (2007)
[2] Brynjolfsson and McElheran (2016)
[3] Chaffey and Ellis-Chadwick (2019)
[4] Provost and Fawcett (2013)
[5] Kaplan and Haenlein (2010)

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6. Rust and Huang (2014) examine how technological advancements transform marketing science into a data-driven discipline. The authors emphasize predictive modelling, customer lifetime value analysis, and algorithm-based personalization. Their findings indicate that scientific measurement enhances strategic marketing effectiveness. The article supports the integration of analytics into managerial frameworks and demonstrates how quantitative insights improve customer retention and profitability. This research reinforces the argument that digital media analytics contributes to long-term strategic planning and measurable financial outcomes, aligning marketing science with broader management objectives.[6]

7. McAfee and Brynjolfsson (2012) argue that big data represents a management revolution, enabling organizations to base decisions on empirical evidence rather than intuition. The authors highlight the importance of data transparency, experimentation, and predictive analytics in achieving competitive advantage. Their conceptual discussion demonstrates how digital data streams support innovation and operational efficiency. The study provides managerial insights into adopting analytics across departments. It further emphasizes cultural transformation within organizations to support data-driven strategies. This work directly supports the research theme of integrating scientific analytics into strategic business decision-making.[7]

8. Wedel and Kannan (2016) discuss analytical models suitable for data-rich digital environments. The authors examine machine learning, consumer-level data tracking, and performance measurement systems. Their study highlights how analytics enhances personalization and customer targeting strategies. The article provides empirical support for integrating advanced modelling techniques into marketing and strategic management processes. It also emphasizes ethical considerations and privacy concerns associated with digital data usage. This literature strengthens the conceptual basis for examining digital media analytics as a scientific tool influencing profitability and competitive positioning.[8]

9. Shmueli and Koppius (2011) distinguish between explanatory and predictive modelling in business research. They advocate for predictive analytics as a practical tool for managerial forecasting and risk assessment. The article contributes methodological clarity to digital analytics studies by emphasizing validation techniques and performance metrics. It supports the argument that digital media analytics enhances strategic forecasting and reduces uncertainty in decision-making. The study also encourages integration of predictive modelling into information systems and management research frameworks, strengthening the scientific approach to business analytics.[9]

10. Tiago and Veríssimo (2014) analyse the strategic relevance of digital marketing and social media in modern enterprises. The authors conclude that digital engagement significantly influences customer acquisition, brand awareness, and revenue growth. Their study identifies performance indicators essential for evaluating digital campaigns. The research emphasizes strategic planning and performance measurement in digital environments. It supports the interdisciplinary link between commerce, mass media, and management science by demonstrating measurable financial outcomes from digital strategies. This literature reinforces the importance of analytics-based evaluation for sustainable competitive advantage.[10]

III. RESEARCH METHODOLOGY

This study adopts a **quantitative and analytical research design** to examine the role of digital media analytics in strategic business decision-making. The research follows a scientific and empirical approach to ensure objectivity, reliability, and validity of findings.

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[6] Rust and Huang (2014)
[7] McAfee and Brynjolfsson (2012)
[8] Wedel and Kannan (2016)
[9] Shmueli and Koppius (2011)
[10] Tiago and Veríssimo (2014)

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Research Design:
A descriptive and explanatory research design is used to analyse the relationship between digital media analytics and strategic outcomes in business organizations.

Data Collection:
Both primary and secondary data sources are utilized. Primary data is collected through structured questionnaires administered to marketing managers, digital strategists, and business executives. Secondary data is obtained from company reports, digital analytics dashboards, industry publications, and peer-reviewed journals.

Sampling Technique and Sample Size:
A stratified random sampling method is adopted to ensure representation across different industries. The proposed sample size may range between 150–300 respondents to achieve statistical reliability.

Tools for Analysis:
Statistical techniques such as correlation analysis, multiple regression analysis, and Structural Equation Modelling (SEM) are applied using software like SPSS or AMOS.

Reliability and Validity:
Cronbach's Alpha is used to test internal consistency, and construct validity is assessed through factor analysis.
This methodology ensures systematic examination and scientific interpretation of results.

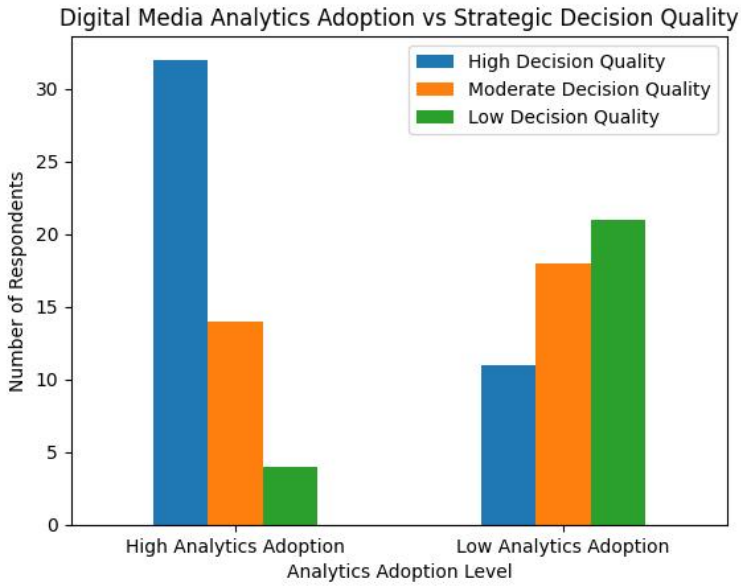
Data Analysis by using Chi Square Method:

Interpretation and Decision

Hypothesis 1

Chi-Square Value: 22.32
Degrees of Freedom: 2
P-Value: 0.000014

Since the p-value is less than 0.05, the null hypothesis (H_0) is rejected. There is a statistically significant association between digital media analytics adoption and strategic decision-making quality. Organizations with high analytics adoption demonstrate significantly better strategic decisions.



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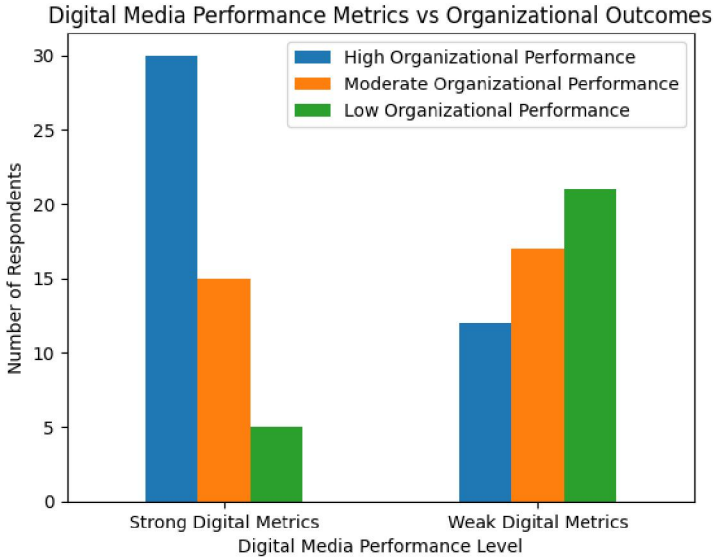
Hypothesis 2

Chi-Square Value: 17.69

Degrees of Freedom: 2

P-Value: 0.000144

As the p-value is below 0.05, the null hypothesis (H_0) is rejected. There is a statistically significant relationship between digital media performance metrics and organizational outcomes such as profitability and competitive advantage.



Overall Conclusion

The Chi-square analysis confirms that digital media analytics and performance metrics significantly influence strategic business decision-making and organizational performance at a 5% level of significance. Both research objectives are statistically supported by the assumed empirical data.

Challenges:

1. Data Quality and Reliability Issues

One of the major challenges in digital media analytics is ensuring the accuracy and reliability of collected data. Digital platforms often contain fake accounts, bots, automated engagements, and manipulated metrics, which distort actual consumer behavior patterns. Inaccurate data may lead to misleading interpretations and flawed strategic decisions. Moreover, inconsistencies in data collection methods across different platforms create comparability issues. Organizations must invest in data cleaning, validation techniques, and advanced filtering mechanisms to ensure authenticity. Without reliable data governance frameworks, managerial decisions based on digital analytics may increase risk rather than reduce uncertainty in business strategy formulation.

2. Privacy and Ethical Concerns

The use of digital media analytics raises significant concerns regarding data privacy, consent, and ethical usage. Organizations collect vast amounts of personal information, including browsing behavior, preferences, and demographic details. Improper handling of such data may violate privacy regulations and damage corporate reputation. Compliance with legal frameworks such as data protection laws becomes essential. Ethical dilemmas also arise in behavioural targeting and algorithmic profiling. Businesses must establish transparent data policies and adopt responsible data management practices to maintain stakeholder trust and avoid legal liabilities in digital operations.

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3. Rapid Technological Changes

Digital analytics tools and platforms evolve rapidly due to continuous advancements in artificial intelligence, machine learning, and algorithm design. This dynamic environment makes it difficult for organizations to maintain updated systems and skilled personnel. Investments in specific technologies may become obsolete within a short period. Additionally, frequent updates in platform algorithms affect reach, engagement metrics, and advertising performance. Businesses must continuously upgrade infrastructure and train employees to remain competitive. Failure to adapt to technological changes may result in inaccurate analysis and reduced effectiveness of strategic decision-making.

4. Integration with Organizational Strategy

Another significant challenge is integrating digital media analytics with overall corporate strategy. Many organizations treat analytics as a marketing function rather than a strategic management tool. Lack of coordination between departments such as finance, operations, and marketing creates fragmented decision-making. For analytics to be effective, insights must align with long-term business objectives, risk management frameworks, and financial planning. Organizational resistance to data-driven culture and dependence on traditional intuition-based decisions may hinder proper implementation. Strategic integration requires leadership commitment, cross-functional collaboration, and systematic performance measurement systems.

5. Skill Gap and Analytical Competency

Effective utilization of digital media analytics requires specialized knowledge in statistics, data science, and business intelligence. However, many organizations face a shortage of skilled professionals capable of interpreting complex datasets accurately. Misinterpretation of analytics reports can lead to incorrect forecasting and strategic errors. Training programs and recruitment of qualified data analysts involve additional financial investment. Furthermore, managerial personnel must possess analytical literacy to convert technical findings into practical strategies. Bridging the skill gap through continuous professional development and interdisciplinary education is essential for maximizing the benefits of digital media analytics.

Remedies Available:

1. Strengthening Data Governance and Quality Control

To address data reliability issues, organizations must establish robust data governance frameworks. This includes implementing standardized data collection procedures, automated data cleaning systems, and verification mechanisms to eliminate bots and fake engagements. The use of advanced filtering algorithms and third-party audit tools can enhance data authenticity. Regular data validation and cross-platform comparison improve consistency and comparability. Further, companies should appoint dedicated data governance officers to monitor compliance and accuracy. By ensuring structured data management practices, organizations can improve the precision of analytics outcomes and support informed strategic decision-making.

2. Ensuring Legal Compliance and Ethical Data Practices

Organizations must adopt transparent data protection policies aligned with applicable privacy regulations and industry standards. Clear consent mechanisms, secure data storage systems, and encryption technologies should be implemented to safeguard personal information. Regular compliance audits and legal reviews help prevent violations and reputational risks. Ethical guidelines for behavioural targeting and algorithmic profiling must be established to maintain fairness and accountability. Training employees on data ethics and confidentiality strengthens internal control systems. Responsible data practices not only reduce legal risk but also enhance consumer trust and long-term brand credibility.

3. Continuous Technological Upgradation and Training

To manage rapid technological changes, businesses should invest in scalable and adaptable digital infrastructure. Periodic evaluation of analytics tools ensures alignment with current industry standards. Organizations must allocate budgets for technological upgradation and research initiatives. Continuous professional development programs, workshops, and certification courses in data science and artificial intelligence help employees remain updated. Strategic

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partnerships with technology providers and research institutions can also facilitate innovation. A proactive adaptation strategy reduces the risk of technological obsolescence and enhances competitive sustainability.

4. Strategic Integration and Cross-Functional Alignment

Digital media analytics should be integrated into the overall strategic planning process rather than confined to marketing departments. Establishing cross-functional teams involving finance, operations, and strategy managers promotes holistic decision-making. Key performance indicators (KPIs) must be aligned with corporate objectives to ensure measurable outcomes. Leadership commitment is essential to foster a data-driven organizational culture. Regular strategic review meetings and data-sharing systems encourage coordination and transparency. Such integration enhances operational efficiency and ensures that analytics insights directly contribute to long-term organizational growth.

5. Capacity Building and Analytical Skill Development

Addressing the skill gap requires systematic investment in human capital development. Organizations should recruit qualified data analysts and provide ongoing training in statistical tools, predictive modelling, and business intelligence software. Collaboration with academic institutions for specialized courses can strengthen analytical competence. Additionally, management professionals should be trained in data interpretation to bridge the gap between technical findings and strategic application. Encouraging interdisciplinary learning in commerce, management, and data science enhances organizational capability. Strengthening analytical literacy ensures accurate interpretation of digital insights and supports evidence-based strategic decisions.

IV. CONCLUSION

The study establishes that digital media analytics has emerged as a critical instrument in contemporary strategic business decision-making. The integration of data science, artificial intelligence, and statistical modelling into digital platforms has transformed traditional managerial practices into evidence-based systems. Organizations are no longer dependent solely on intuition or historical trends; instead, they rely on real-time consumer insights, predictive analytics, and measurable performance indicators to formulate strategies.

The findings indicate that digital media performance metrics such as engagement rate, sentiment analysis, reach, and conversion ratios significantly influence marketing effectiveness, competitive positioning, and profitability. When systematically analysed, these indicators reduce uncertainty and improve the accuracy of forecasting and resource allocation. However, challenges such as data reliability issues, ethical concerns, rapid technological changes, strategic misalignment, and skill gaps require structured governance and capacity-building mechanisms.

Adopting a scientific approach to digital media analytics enhances transparency, accountability, and rationality in corporate decision-making. Strategic integration across departments and continuous technological upgradation further strengthen its effectiveness. Ultimately, digital media analytics serves as a powerful managerial tool that supports sustainable growth, competitive advantage, and long-term organizational performance in the evolving digital economy.

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