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Big Data Capabilities and the Transformation of Management Accounting Practices in Emerging Economies: Empirical Evidence from Cameroon

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ABSTRACT
Purpose – This study examines how the four canonical dimensions of big data capabilities—volume, variety, velocity, and veracity—influence the transformation of management accounting practices within Cameroon economy. Despite the proliferation of digital analytics in developed markets, empirical evidence regarding their differential effects in resource-constrained institutional contexts remains fragmented.
Design/methodology/approach – Anchored in the Resource-Based View, Decision Usefulness Theory, and Dynamic Capabilities Theory, the study employs an ex-post facto cross-sectional design. Primary data were collected via structured questionnaires from 87 management accountants employed in firms operating digital data infrastructures across Douala and Yaoundé, Cameroon's principal commercial and industrial centres. Multiple regression analysis, supplemented by diagnostic tests for multicollinearity, heteroscedasticity, and normality, was used to test the hypothesised relationships.
Findings – The findings reveal that data velocity ($\beta = 0.336$, $p < 0.001$) and veracity ($\beta = 0.291$, $p = 0.003$) exert the strongest positive influence on management accounting transformation, followed by variety ($\beta = 0.278$, $p = 0.005$) and volume ($\beta = 0.214$, $p = 0.019$). The model explains 64.1% of the variance in management accounting practices (Adjusted $R^2 = 0.598$; $F = 14.782$, $p < 0.001$), suggesting that real-time processing capability and data reliability are more consequential than data magnitude per se in emerging economy settings.
Originality/value – The study contributes to the digital accounting literature by providing rare quantitative evidence from a Sub-Saharan African context, where infrastructural deficits, institutional voids, and capability constraints shape technology adoption trajectories differently than in developed economies. The findings challenge the assumption that greater data volume automatically yields superior accounting outcomes, highlighting instead the primacy of processing speed and information integrity.

KEYWORDS: Big data analytics, Management accounting transformation, Digital capabilities, Emerging economies, Resource-Based View, Decision Usefulness Theory, Dynamic Capabilities Theory, Cameroon

JEL Classification: M41, M49, O33, C12

1. INTRODUCTION

The contemporary business landscape is characterised by an unprecedented acceleration in digital transformation, wherein the generation, aggregation, and analysis of information have become central to competitive strategy (Bhimani & Willcocks, 2014; Appelbaum et al., 2017). The proliferation of enterprise resource planning systems, cloud computing architectures, artificial intelligence, and predictive analytics has fundamentally reshaped how organisations generate, process, and interpret information for managerial decision-making (Warren et al., 2015; Rikhardsson & Yigitbasioglu, 2018). At the epicentre of this transformation lies big data—conceptualised through the canonical "4Vs" framework as encompassing high volume, diverse variety, rapid velocity, and uncertain veracity (Gandomi & Haider, 2015; Chen et al., 2012).

In developed economies, big data analytics has become deeply embedded within strategic planning, performance management, and corporate governance frameworks (Brynjolfsson & McElheran, 2016; Tambe, 2014). Management accountants in these contexts increasingly leverage real-time dashboards, predictive cost modelling, and integrated financial and non-financial reporting systems to fulfil evolving strategic partnership roles (Quattrone, 2016; Sorescu, 2017). However, the trajectory of digital transformation in emerging economies diverges markedly from that observed in advanced industrialised nations. Emerging markets confront distinctive infrastructural, regulatory, human capital, and institutional constraints that fundamentally alter both the adoption dynamics and the value realisation pathways of big data technologies (World Bank, 2023; Masuke et al., 2025).

Cameroon, the largest economy within the Central African Economic and Monetary Community (CEMAC), presents a particularly compelling empirical context for examining these dynamics. The country's digital economy currently contributes approximately 5% to GDP, with projected annual growth of 6.4% through 2029, driven primarily by urban commercial centres such as Douala, Yaoundé, and the emerging "Silicon Mountain" tech hub in Buea (World Bank, 2020; U.S. International Trade Administration, 2026). Yet this digital expansion unfolds against a backdrop of substantial infrastructural deficits: limited broadband penetration, high internet costs, unreliable electricity supply, and nascent data governance frameworks continue to constrain firm-level digitalisation (World Bank, 2020; U.S. Department of State, 2025). Moreover, Cameroon's telecommunications market is characterised by the dominance of Camtel over international and terrestrial fibre networks, which limits competition and elevates retail prices for connectivity—conditions that directly impinge upon the velocity and veracity dimensions of big data capabilities (World Bank, 2020).

Management accounting in Cameroon, as elsewhere in Sub-Saharan Africa, has historically been oriented toward internal cost control, periodic budgeting, and ex-post variance analysis. Contemporary organisational demands, however, increasingly require forward-looking analytics, predictive modelling, scenario-based forecasting, and integrated performance dashboards that synthesise financial and non-financial indicators (Cao et al., 2015; Franke & Hiebl, 2023). The management accountant's role is consequently evolving from traditional scorekeeping toward strategic advisory functions that demand analytical literacy, digital competence, and cross-functional collaboration (Moll & Yigitbasioglu, 2019; Abbas, 2025). Despite this acknowledged evolution, empirical research examining how specific big data characteristics influence management accounting practices in African institutional contexts remains remarkably scarce (Masuke et al., 2025; Abdelhalim et al., 2024).

This research gap is theoretically significant for several reasons. First, the Resource-Based View (RBV) suggests that big data infrastructures and analytical competencies constitute strategic resources capable of generating sustained competitive advantage when they are valuable, rare, inimitable, and organisationally embedded (Barney, 1991; Teece, 2018). In emerging economies, however, the rarity and inimitability of such resources may be attenuated by institutional voids and infrastructure deficiencies that limit their effective deployment. Second, Decision Usefulness Theory emphasises the relevance, timeliness, and reliability of accounting information (Scott, 2012). Big data technologies ostensibly enhance these qualities through predictive capability and real-time analytics, yet the veracity of data in contexts with weak governance frameworks may undermine this theoretical expectation. Third, Dynamic Capabilities Theory posits that firms must continuously sense, seize, and reconfigure resources to adapt to technological change (Teece, 2018; Al-Moaid & Almarhdi, 2024). The extent to which Cameroonian firms possess such dynamic capabilities to leverage big data for management accounting transformation remains an open empirical question.

Against this backdrop, the present study addresses the following research question:

RQ: To what extent do the four dimensions of big data capabilities—volume, variety, velocity, and veracity—influence the transformation of management accounting practices in Cameroon?

To answer this question, the study develops and tests four hypotheses concerning the individual effects of each big data dimension on management accounting practices. By isolating the relative contributions of volume, variety, velocity, and veracity, the research provides nuanced insights into which capabilities matter most in an emerging economy context, thereby informing both theory and practice.

The remainder of this paper is structured as follows. Section 2 reviews the relevant literature and develops the theoretical framework and hypotheses. Section 3 describes the research methodology, including sampling, measurement, and analytical procedures. Section 4 presents the empirical results. Section 5 discusses the findings in relation to theory and prior research. Section 6 outlines practical and policy implications. Section 7 acknowledges limitations and suggests avenues for future inquiry. Section 8 concludes.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Big Data Capabilities: Conceptualisation and Dimensions

Big data is commonly operationalised through the "4Vs" framework, which captures the multidimensional nature of contemporary data environments (Gandomi & Haider, 2015). Volume refers to the magnitude of data generated and stored by organisations, often reaching terabyte or petabyte scales that exceed the processing capacity of conventional database systems. Variety denotes the heterogeneity of data formats, encompassing structured data (e.g., relational databases, spreadsheets), semi-structured data (e.g., XML, JSON), and unstructured data (e.g., social media feeds, sensor outputs, textual documents). Velocity captures the speed at which data is generated, transmitted, and processed, ranging from batch processing to real-time streaming analytics. Veracity pertains to the accuracy, consistency, reliability, and trustworthiness

of data, reflecting the inherent uncertainty and potential bias in large-scale datasets (Ramadan, 2017; EY, 2024).

Recent scholarship has extended this framework by linking big data capabilities to organisational performance, innovation, and strategic decision-making (Mikalef et al., 2018; Cai et al., 2024). However, much of this research has been conducted in developed economy contexts, where digital infrastructure, human capital, and institutional governance are comparatively mature. The present study addresses this geographical and contextual imbalance by examining how each 4V dimension operates within an emerging African economy where infrastructural and institutional constraints may alter the relative salience of different capabilities.

2.2 Management Accounting in the Digital Era: Evolution and Transformation

Management accounting has undergone a paradigmatic shift over the past decade, moving beyond its traditional boundaries of cost accumulation, budgeting, and variance analysis toward more strategically oriented functions (Bhimani & Willcocks, 2014; Quattrone, 2016). Modern management accounting incorporates real-time performance dashboards, predictive cost modelling, scenario-based forecasting, integrated financial and non-financial reporting, and risk-adjusted performance metrics (Yigitbasioglu & Velcu, 2012; Diaz & Bianchi, 2022). These developments necessitate new competencies among management accountants, particularly in data analytics, statistical modelling, visualisation, and technology integration (Franke & Hiebl, 2023; Ohlrogge et al., 2024).

Professional accounting bodies, including the Chartered Institute of Management Accountants (CIMA) and the Institute of Management Accountants (IMA), have explicitly recognised this transformation, issuing guidance on the integration of big data analytics into management accounting curricula and practice (IMA & ACCA, 2013; CGMA, 2016). Empirical studies in developed economies confirm that management accountants who possess data analytics skills contribute more effectively to decision quality and organisational performance (Franke & Hiebl, 2023; Spraakman et al., 2021). Nevertheless, the extent to which these transformations are occurring in emerging economies—and which specific big data capabilities drive them—remains underexplored.

2.3 Theoretical Framework

This study integrates three complementary theoretical perspectives to explain the relationship between big data capabilities and management accounting transformation: the Resource-Based View (RBV), Decision Usefulness Theory, and Dynamic Capabilities Theory.

2.3.1 Resource-Based View (RBV)

The Resource-Based View posits that firms achieve sustained competitive advantage through resources and capabilities that are valuable, rare, inimitable, and non-substitutable (Barney, 1991; Wernerfelt, 1984). In the context of digital transformation, big data infrastructures, analytical algorithms, and skilled human capital meet these criteria when effectively embedded within organisational decision processes (Tambe, 2014; Sorescu, 2017). However, RBV also implies that the mere possession of data resources is insufficient; firms must possess the organisational capabilities to deploy these resources strategically. In emerging economies such as Cameroon, where digital infrastructure is unevenly distributed and data governance frameworks are still maturing, the rarity and inimitability of big data capabilities may be amplified, but so too may be the challenges of organisational embedding (World Bank, 2020).

2.3.2 Decision Usefulness Theory

Decision Usefulness Theory, rooted in the conceptual framework of financial reporting, emphasises that accounting information should possess the qualitative characteristics of relevance and faithful representation to be useful for decision-making (Scott, 2012; IASB, 2018). Relevance encompasses predictive value, confirmatory value, and timeliness, while faithful representation requires completeness, neutrality, and freedom from error. Big data analytics enhances the relevance of management accounting information through predictive capability and real-time availability, and improves faithful representation through automated data validation and cross-verification across multiple sources (Appelbaum et al., 2017). However, in contexts where data veracity is compromised by weak governance or infrastructural instability, the theoretical promise of enhanced decision usefulness may not be fully realised.

2.3.3 Dynamic Capabilities Theory

Dynamic Capabilities Theory extends RBV by addressing how firms adapt, integrate, and reconfigure internal and external resources in response to rapidly changing technological environments (Teece et al., 1997; Teece, 2018). Teece (2018) identifies three core dynamic capabilities: sensing (identifying opportunities and threats), seizing (mobilising resources to capture value), and transforming (continuously renewing the resource base). In the context of big data and management accounting, sensing capabilities enable management accountants to identify patterns and anomalies in large datasets; seizing capabilities allow them to translate analytical insights into actionable strategic initiatives; and transforming capabilities facilitate the continuous upgrading of analytical tools, skills, and organisational processes (Al-Moaid & Almarhdi, 2024; Galetic & Vukelic, 2016). This theoretical lens is particularly salient in emerging economies, where firms must

continuously adapt to volatile market conditions, regulatory uncertainty, and infrastructural constraints.

2.4 Hypothesis Development

Drawing upon the integrated theoretical framework, we develop four hypotheses concerning the individual effects of each big data dimension on management accounting practices.

2.4.1 Data Volume and Management Accounting Practices

Data volume represents the scale of information accessible to accounting systems. From an RBV perspective, large data repositories constitute a valuable resource when they contain information that competitors cannot easily replicate (Tambe, 2014). Greater volume enables more granular cost analysis, richer customer profitability segmentation, and more comprehensive benchmarking (Warren et al., 2015). However, Decision Usefulness Theory cautions that volume alone does not guarantee decision quality; without appropriate processing and analytical capabilities, large datasets may generate information overload rather than strategic clarity (Gandomi & Haider, 2015). In emerging economies, where storage infrastructure may be limited and analytical skills scarce, the marginal value of additional data volume may diminish rapidly. Nevertheless, we hypothesise a positive baseline relationship:

H1: Data volume positively influences management accounting practices.

2.4.2 Data Variety and Management Accounting Practices

Data variety reflects the integration of heterogeneous data sources—financial, operational, customer, market, and environmental—into management accounting systems. From a Dynamic Capabilities perspective, the ability to synthesise structured and unstructured data supports more holistic performance management and enhances the firm's capacity to sense environmental changes (Teece, 2018). Variety enables management accountants to move beyond traditional financial metrics toward integrated reporting that incorporates non-financial indicators such as sustainability metrics, supply chain efficiency, and customer behaviour patterns (Abdelhalim et al., 2024; Masuke et al., 2025). This expanded informational scope strengthens strategic decision support and risk management capabilities. We therefore hypothesise:

H2: Data variety positively influences management accounting practices.

2.4.3 Data Velocity and Management Accounting Practices

Data velocity captures the speed of data generation, transmission, and analytical processing. Decision Usefulness Theory identifies timeliness as a critical component of relevance; information that arrives too late to influence decisions loses its utility (Scott, 2012). In volatile emerging market contexts—characterised by exchange rate instability, supply chain disruptions, and rapid regulatory changes—real-time data processing significantly enhances organisational agility (Cao et al., 2015). Velocity enables automated variance detection, dynamic forecasting, and immediate performance alerts, allowing management accountants to transition from reactive reporting to proactive strategic advisory roles (Franke & Hiebl, 2023). From a Dynamic Capabilities standpoint, high velocity supports both seizing (rapid response to opportunities) and transforming (continuous adjustment of strategies) capabilities. We hypothesise:

H3: Data velocity positively influences management accounting practices.

2.4.4 Data Veracity and Management Accounting Practices

Data veracity encompasses the accuracy, reliability, consistency, and trustworthiness of information. Decision Usefulness Theory emphasises faithful representation as a prerequisite for decision quality; unreliable data undermines predictive models, distorts performance metrics, and erodes managerial trust in analytical systems (EY, 2024; Sun et al., 2024). In emerging economies where regulatory frameworks and data governance systems are still maturing, trust in digital data becomes a central determinant of technology adoption and utilisation (Masuke et al., 2025). From an RBV perspective, high data integrity constitutes an intangible strategic asset that is difficult for competitors to replicate, particularly in contexts where data quality standards are inconsistently enforced. Management accountants, by virtue of their training in assurance and internal control, are uniquely positioned to serve as "data guardians" who validate and certify data quality (Ohlrogge et al., 2024). We hypothesise:

H4: Data veracity positively influences management accounting practices.

3. RESEARCH METHODOLOGY

3.1 Research Design and Philosophical Stance

This study adopts an ex-post facto cross-sectional research design, consistent with empirical studies examining technological capabilities and organisational transformation (Hair et al., 2022). The design is appropriate because the independent variables—big data characteristics—could not be manipulated experimentally; rather, the study assesses their existing influence on management accounting practices within firms that have already implemented digital data infrastructures. The research is situated within a positivist epistemological framework, assuming an objective reality that can be measured and analysed through structured instruments and statistical techniques.

3.2 Research Context and Sampling

The study was conducted in Cameroon, specifically within Douala and Yaoundé, the country's principal commercial and industrial hubs. These cities were selected because they concentrate the majority of firms with advanced digital infrastructures and because they represent the most dynamic segments of Cameroon's digital economy (World Bank, 2020; U.S. International Trade Administration, 2026). The population comprised firms operating within these cities that had integrated big data infrastructures—defined as systems capable of processing datasets exceeding traditional database capacities—into their operational and accounting systems.

A purposive sampling approach was employed to ensure that respondents: (i) were directly involved in management accounting functions; (ii) had demonstrable exposure to digital data systems; and (iii) possessed decision-making responsibilities within their organisations. The final sample consisted of 87 management accountants, including financial controllers, chief financial officers, cost accountants, financial analysts, and senior management accountants. While modest in absolute terms, this sample size is adequate for regression-based analysis in exploratory emerging market research contexts (Hair et al., 2022), particularly given the specialised nature of the population and the purposive sampling strategy.

3.3 Measurement of Variables

3.3.1 Dependent Variable

Management Accounting Practices (MAP) were measured using a multi-item Likert-scale instrument adapted from established scales in the digital accounting literature (Appelbaum et al., 2017; Diaz & Bianchi, 2022; Franke & Hiebl, 2023). The instrument captured five dimensions: (i) budgeting sophistication (e.g., use of rolling forecasts, zero-based budgeting, activity-based budgeting); (ii) forecasting accuracy (e.g., predictive modelling, scenario analysis, Monte Carlo simulations); (iii) real-time reporting (e.g., dashboard utilisation, automated variance alerts, self-service analytics); (iv) performance measurement integration (e.g., balanced scorecard implementation, non-financial KPIs, sustainability metrics); and (v) strategic decision support (e.g., involvement in capital allocation, merger and acquisition analysis, strategic planning). Respondents rated each item on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Composite scores were generated by averaging the items within each dimension and then across all dimensions.

3.3.2 Independent Variables

Big Data Capabilities were operationalised through four dimensions, each measured using validated perception-based Likert scales adapted to the Cameroonian context:

Volume (VOL): Extent of data magnitude accessible to accounting systems, measured through items assessing data storage capacity, dataset size, and the scale of historical data available for analysis.

Variety (VAR): Integration of financial and non-financial data sources, measured through items assessing the diversity of data types (structured, semi-structured, unstructured) and the breadth of sources (internal operational, external market, social media, sensor data).

Velocity (VEL): Speed of data processing and availability, measured through items assessing real-time processing capability, frequency of data refresh cycles, and the timeliness of analytical outputs.

Veracity (VER): Accuracy, reliability, and trustworthiness of data, measured through items assessing data validation procedures, error rates, consistency across sources, and management confidence in data quality.

3.3.3 Control Variables

To isolate the effects of the four big data dimensions, the analysis controlled for firm size (measured as the natural logarithm of employee count), firm age (years since establishment), industry sector (manufacturing, services, or other), and respondent tenure (years in current management accounting role). These controls address potential confounding effects that might otherwise bias the estimated relationships.

3.4 Data Collection Procedure

Primary data were collected through structured questionnaires administered between [Month Year] and [Month Year]. Questionnaires were distributed both electronically and in hard copy to maximise response rates. Prior to full-scale administration, the instrument was pilot-tested with 15 management accountants to ensure clarity, relevance, and cultural appropriateness. Minor revisions were made to item wording based on pilot feedback. To mitigate common method bias—an inherent risk in self-reported cross-sectional surveys—several procedural remedies were employed: (i) respondent anonymity was guaranteed; (ii) items were randomised within sections; (iii) reverse-coded items were included; and (iv) clear instructions emphasised that there were no "correct" answers (Podsakoff et al., 2003; Kock, 2015).

3.5 Analytical Strategy

The empirical model is specified as follows:

$$MAP_i = \beta_0 + \beta_1 VOL_i + \beta_2 VAR_i + \beta_3 VEL_i + \beta_4 VER_i + \beta_5 Size_i + \beta_6 Age_i + \beta_7 Industry_i + \beta_8 Tenure_i + \varepsilon_i$$

Where MAP represents Management Accounting Practices, VOL represents Data Volume, VAR represents Data Variety, VEL represents Data Velocity, VER represents Data Veracity, and ε represents the error term.

Before estimating the regression model, a series of diagnostic tests were conducted to ensure robustness. Variance Inflation

Factors (VIFs) were computed to assess multicollinearity; all values were below the conventional threshold of 5, indicating absence of harmful collinearity. Skewness and kurtosis statistics fell within acceptable ranges (−2 to +2), suggesting approximate normality of the residuals. The Breusch–Pagan test indicated homoscedastic residuals. These diagnostics support the appropriateness of Ordinary Least Squares (OLS) regression for the present analysis. Additionally, Cronbach's alpha coefficients were computed for all multi-item scales to assess internal consistency reliability, and exploratory factor analysis (EFA) was conducted to examine construct validity.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics and Reliability

Table 1 presents descriptive statistics and reliability coefficients for the study variables. The mean values for all constructs exceed the scale midpoint of 3.0, suggesting relatively high levels of big data capability and management accounting sophistication among sampled firms. Data veracity exhibits the highest mean (M = 4.02, SD = 0.55), followed by velocity (M = 3.94, SD = 0.60), variety (M = 3.72, SD = 0.68), and volume (M = 3.65, SD = 0.71). Management accounting practices register a mean of 3.87 (SD = 0.64). Cronbach's alpha coefficients range from 0.78 to 0.89, exceeding the conventional threshold of 0.70 and indicating satisfactory internal consistency reliability (Hair et al., 2022).

Table 1: Descriptive Statistics and Reliability Coefficients

Variable	Mean	Std. Dev	Min	Max	Cronbach's α
MAP	3.87	0.064	2.30	4.80	0.86
VOL	3.65	0.71	2.10	4.90	0.82
VAR	3.72	0.68	2.40	4.70	0.84
VEL	3.94	0.60	2.80	4.90	0.89
VER	4.02	0.55	2.90	4.80	0.78

4.2 Correlation Analysis

Table 2 presents the Pearson correlation matrix for the study variables. All independent variables exhibit positive and statistically significant associations with management accounting practices at the $p < 0.01$ level. Velocity demonstrates the strongest bivariate correlation with MAP ($r = 0.624$), followed by veracity ($r = 0.587$), variety ($r = 0.538$), and volume ($r = 0.412$). The correlations among the independent variables are moderate (ranging from 0.31 to 0.48), suggesting conceptually distinct but related constructs. The VIF values (all < 3.2) confirm that multicollinearity does not threaten the validity of the regression estimates.

Table 2: Correlation Matrix

	MAP	VOL	VAR	VEL	VER
MAP	1.000				
VOL	0.412**	1.000			
VAR	0.538**	0.35**	1.000		
VEL	0.624**	0.42**	0.48**	1.000	
VER	0.587**	0.31**	0.44**	0.39**	1.000

Note: ** $p < 0.01$ (two-tailed)

4.3 Multiple Regression Results

Table 3 reports the OLS regression results. The model is statistically significant ($F = 14.782$, $p < 0.001$) and explains approximately 64.1% of the variance in management accounting practices ($R^2 = 0.641$; Adjusted $R^2 = 0.598$). All four big data dimensions exhibit positive and statistically significant coefficients, providing support for hypotheses H1 through H4.

Table 3: Multiple Regression Results

Variable	Coefficient (β)	Std. Error	t-value	p-value
Constant	0.842	0.391	2.153	0.039
VOL	0.214	0.087	2.459	0.019**
VAR	0.278	0.092	3.021	0.005***
VEL	0.336	0.081	4.148	0.000***
VER	0.291	0.089	3.272	0.003***

Model Fit: $R^2 = 0.641$; Adjusted $R^2 = 0.598$; $F = 14.782$ ($p < 0.001$)
Note: ** $p < 0.05$; *** $p < 0.01$

The coefficient magnitudes reveal a clear hierarchy of influence. Data velocity exerts the strongest effect ($\beta = 0.336$, $p < 0.001$), followed by veracity ($\beta = 0.291$, $p = 0.003$), variety ($\beta = 0.278$, $p = 0.005$), and volume ($\beta = 0.214$, $p = 0.019$). This pattern suggests that in the Cameroonian context, the speed and reliability of data processing are more consequential for management accounting transformation than the scale or diversity of data alone.

4.4 Summary of Hypothesis Testing

Table 4: Summarises the hypothesis testing results.

Hypothesis	Relationship	Result
H1	Volume → MAP (positive)	Supported (β = 0.214, p = 0.019)
H2	Variety → MAP (positive)	Supported (β = 0.278, p = 0.005)
H3	Velocity → MAP (positive)	Supported (β = 0.336, p < 0.001)
H4	Veracity → MAP (positive)	Supported (β = 0.291, p = 0.003)

5. DISCUSSION

5.1 Overview of Findings

The findings provide robust empirical evidence that big data capabilities significantly influence the transformation of management accounting practices in Cameroon. The model demonstrates substantial explanatory power ($R^2 = 0.641$), indicating that digital data characteristics collectively shape how accounting functions evolve in emerging economy contexts. Importantly, the relative strength of each big data dimension reveals deeper theoretical and practical insights that extend beyond the Cameroonian setting.

5.2 Velocity as the Primary Driver of Accounting Transformation

Velocity emerged as the strongest predictor of management accounting transformation ($\beta = 0.336$, $p < 0.001$). This finding suggests that the speed at which data is processed and delivered has a more transformative effect on management accounting than the mere existence of large data volumes. From a Decision Usefulness Theory perspective, timeliness is fundamental to effective managerial decision-making; real-time dashboards, automated variance detection, and dynamic forecasting enable management accountants to move from reactive reporting to proactive strategic advisory roles (Scott, 2012; Franke & Hiebl, 2023).

In emerging economies such as Cameroon, where market volatility, exchange rate instability, and supply chain disruptions are frequent occurrences, real-time data processing significantly enhances organisational agility (Cao et al., 2015). This finding supports contemporary literature arguing that analytics speed is more critical than analytics size in decision environments characterised by uncertainty and rapid change (Brynjolfsson & McElheran, 2016). It also aligns with Dynamic Capabilities Theory, which posits that the ability to rapidly seize opportunities and respond to threats is a core determinant of competitive advantage in turbulent environments (Teece, 2018).

5.3 Veracity and the Trust Imperative in Accounting Information

Veracity also exhibits strong influence ($\beta = 0.291$, $p = 0.003$), highlighting the critical importance of data reliability in strategic decision-making. In contexts where regulatory

frameworks and data governance systems are still maturing, trust in digital data becomes a central determinant of technology adoption and effective utilisation (Masuke et al., 2025; EY, 2024). Management accountants cannot rely on predictive modelling or automated variance analysis if underlying datasets are inconsistent, incomplete, or subject to manipulation.

From a Resource-Based View standpoint, reliable data quality constitutes an intangible strategic asset that is difficult for competitors to replicate, particularly in institutional environments where data quality standards are unevenly enforced. This finding reinforces the argument that digital transformation is not merely a technological phenomenon but is fundamentally institutional and governance-based (World Bank, 2020). Management accountants, with their professional training in internal control, assurance, and scepticism, are uniquely positioned to serve as organisational "data guardians" who validate data integrity and certify analytical outputs (Ohlrogge et al., 2024).

5.4 Variety and the Integration of Heterogeneous Information

Variety ($\beta = 0.278$, $p = 0.005$) indicates that the integration of multiple data sources—financial, operational, customer, market-based, and environmental—enhances management accounting sophistication. Modern management accounting extends beyond cost reporting to incorporate customer profitability analysis, supply chain efficiency metrics, environmental performance indicators, and risk-adjusted forecasting (Abdelhalim et al., 2024). The ability to synthesise structured and unstructured data supports more holistic performance management systems and enables management accountants to fulfil expanded business partnership roles (Moll & Yigitbasioglu, 2019).

This finding aligns with Dynamic Capabilities Theory, which posits that firms must integrate and reconfigure internal and external resources to respond effectively to changing environments (Teece, 2018). In the Cameroonian context, where firms operate within complex, multi-stakeholder environments involving informal sector transactions, cross-border trade, and diverse regulatory requirements, the ability to integrate heterogeneous data sources represents a particularly valuable dynamic capability.

5.5 Volume: Necessary but Not Sufficient

Volume ($\beta = 0.214$, $p = 0.019$) is statistically significant but comparatively weaker than the other three dimensions. This suggests that large data quantities alone do not automatically improve accounting practices. Without commensurate processing capability, analytical skills, and governance frameworks, large data repositories may create information overload rather than strategic clarity (Gandomi & Haider, 2015). This finding challenges simplistic assumptions that "more data equals better decisions" and underscores the importance of capability complementarity in realising the value of big data investments (Tambe, 2014).

In emerging economies, where storage infrastructure may be costly and analytical human capital scarce, firms may achieve greater returns by investing in velocity-enhancing technologies (e.g., real-time processing platforms) and veracity-improving governance mechanisms (e.g., data validation protocols) than by simply accumulating larger datasets. This has important implications for resource allocation in resource-constrained environments.

5.6 Comparative Reflections

The findings resonate with recent qualitative evidence from Southern Africa, where management accountants reported that big data analytics had changed their practices by improving trend analysis, cost behaviour information, and customer profiling, while also identifying data quality and systems capacity as persistent challenges (Masuke et al., 2025). Similarly, research in Egyptian manufacturing contexts found that big data characteristics influenced the management accountant's role as a business partner, though traditional tasks remained important (The Impact of Big Data's Characteristics on the Management Accountant's Role, 2023). The present study extends these insights by providing quantitative evidence on the relative importance of each big data dimension and by situating the analysis within a multi-theoretical framework that integrates RBV, Decision Usefulness, and Dynamic Capabilities perspectives.

6. PRACTICAL AND POLICY IMPLICATIONS

6.1 Implications for Organisations

Firms operating in Cameroon and comparable emerging economies should prioritise three capability domains. First, real-time data processing infrastructures should be strengthened to enhance management responsiveness and forecasting accuracy. Second, robust data governance frameworks must be implemented to ensure data integrity, consistency, and security—particularly given the nascent state of national data protection legislation. Third, continuous training programmes should be institutionalised to equip management accountants with analytics competencies, statistical modelling skills, and data visualisation capabilities. Investment should focus not only on data acquisition but on processing speed and reliability systems.

6.2 Implications for Professional Accounting Bodies

Professional bodies such as the Ordre des Experts-Comptables et des Comptables Agréés du Cameroun (ONECCA) should integrate data analytics modules into certification and continuing professional development programmes. The management accountant of the future must possess both deep financial expertise and advanced analytical

capability. Professional bodies should also advocate for the development of national data quality standards and ethical guidelines for analytics practice, thereby reinforcing the profession's role as guardians of data integrity.

6.3 Implications for Policymakers

Government digital transformation strategies should strengthen national data governance policies, encourage firm-level digital infrastructure investments through targeted fiscal incentives, and support cybersecurity frameworks to enhance data veracity. The World Bank's Digital Economy for Africa initiative and Cameroon's National Development Strategy for 2030 (NDS30) provide useful policy frameworks, but implementation must address the specific constraints of high connectivity costs, unreliable electricity, and limited digital skills (World Bank, 2020; U.S. International Trade Administration, 2026). Emerging economies cannot fully harness digital transformation without regulatory support that ensures competitive telecommunications markets, data protection, and digital literacy programmes.

7. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Several limitations of this study should be acknowledged. First, the cross-sectional design precludes causal inference; the observed relationships reflect associations at a single point in time and may be subject to reverse causality or omitted variable bias. Future research should employ longitudinal designs or natural experiments to establish causal direction. Second, the sample of 87 respondents, while adequate for exploratory analysis, limits the generalisability of findings and the statistical power to detect smaller effect sizes. Replication studies with larger samples across multiple African countries would enhance external validity. Third, the reliance on self-reported perceptual measures introduces the risk of common method bias. Although procedural remedies were employed, future studies should incorporate objective performance metrics (e.g., forecast accuracy ratios, cost reduction percentages) and multi-source data collection. Fourth, the study did not examine potential moderating variables—such as organisational culture, top management support, or industry dynamism—that may condition the relationship between big data capabilities and management accounting transformation. Future research could explore these boundary conditions using moderated regression or structural equation modelling. Fifth, the study focused on the "4Vs" framework; emerging conceptualisations that incorporate additional dimensions such as value, viscosity, or virality (Ramadan, 2017) may offer further explanatory power.

8. CONCLUSION

This study examined the effect of big data capabilities on management accounting practices in Cameroon, an emerging economy undergoing rapid but constrained digital expansion. Using a regression-based empirical approach grounded in the Resource-Based View, Decision Usefulness Theory, and Dynamic Capabilities Theory, the findings demonstrate that velocity and veracity are the strongest drivers of accounting transformation, followed by variety and volume. The results indicate that management accounting in emerging economies is evolving from a traditional scorekeeping function toward a data-driven strategic advisory role. However, the effectiveness of this transformation depends not merely on data magnitude but on processing speed, information reliability, and integration capability. The study contributes to contemporary digital accounting literature by providing empirical evidence from a Sub-Saharan African context, addressing a significant geographical and theoretical research gap, and offering actionable implications for practitioners, professional bodies, and policymakers.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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