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The Influence of Business Analytics on Management Decision Making: A Case of Big Data

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ABSTRACT

The proposed study explores the impact of Big Data-driven business analytics on management accounting information systems (MAIS) and managerial decision-making in Vietnamese firms. Despite research worldwide pointing to the revolutionary nature of analytics in forecasting, performance measurement, and risk management, empirical studies remain scarce in emerging economies. A quantitative method was used to collect data (n=81 Vietnamese firms) in a structured Likert-scale questionnaire that was structured. Cronbach's Alpha, Exploratory Factor Analysis (EFA), and One-Sample t-tests were used to test the reliability, validity, and hypothesis testing. The finding suggests that sophisticated analytical tools, definite decision-making needs, and quality data assurance are the key to the enhanced effectiveness of MAIS. Additionally, Big Data analytics has a positive influence on the decision accuracy, efficiency, IT integration, risk management, and data security. Both the null hypotheses (H01 and H02) were rejected which proved that there is a strong relation between the adoption of Big Data and the enhancement of managerial decisions. Furthermore, the study shows that integrating digital infrastructures, such as cloud data systems, automated accounting tools, and AI-driven analytics, significantly enhances MAIS performance. Although these results are obtained, the researchers also mention such limitations as a small sample, the use of self-reports, and the lack of causal process analysis. The study has some practical implications for SMEs and highlights the necessity of increasing analytical competencies. The findings also emphasize the importance of strengthening IT governance, cybersecurity protocols, and data management standards to support analytics-driven MAIS. The future research must investigate certain ways in which analytics enhance the performance of organizations in different markets.

INTRODUCTION

The concept of big data and business analytics is transforming the manner in which companies gather, analyze, and utilize information to make managerial decisions. Within the past ten years, the roles of accounting have shifted from record-keeping to generating insights under the influence of big, quick, and diverse data sets, and the availability of tools that may discern trends that a human cannot (Adewusi *et al.*, 2024). This change changes the position of the management accountants who have to integrate the knowledge of domains with analytical skills in aiding forecasting, performance measurement, and risk assessment. The opportunities, including better forecasting, increased fraud detection, and more timely management reporting, are clear, and the challenges, including data quality concerns, privacy concerns, and gaps in analytical prowess, are severe (Tiron-Tudor & Deliu, 2021).

However, there are no challenges to this transition to Big Data-driven MAIS. Some of these studies present their positive results, including more profitable organizations, making more knowledgeable decisions, but others also highlight the challenges faced by low-quality data, skill shortages, and risk management. The key aspect of Big Data Analytics (BDA) is that it leads to the

improvement of the quality of management accounting information and its decision-making, although they emphasized that it requires the development of digital infrastructure and analytical talent (Almushaiqeh *et al.*, 2024). Oesterreich and Teuteberg (2019) discovered that in this new era, accountants have been forced to acquire new competencies, including statistical modeling and data governance, to continue being effective. The reason behind this study is thus based on the need to comprehend not only whether Big Data and business analytics enhance MAIS, but also how and under which circumstances, and with what trade-off.

Duy (2025) discovered the role of Big Data in the Management Accounting Information Systems (MAIS) and strategic decision-making. Data collected through a quantitative methodology on various Vietnamese companies were gathered through an online Likert-scale survey and subsequently analyzed using SPSS, and Cronbach's Alpha, EFA, and One-Sample t-tests were used. The results indicate a strong and positive relationship between the integration of Big Data and the effectiveness of MAIS, the improvement of business analytics, profitability analyses, and corporate performance in modern dynamic markets. In spite of the available evidence, one research gap remains significant,

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as the existing literature investigates the connection between Big Data, business analytics, and organizational performance, yet many of them fail to provide specific empirical data.

Particularly, the research on the most effective analytic tools, the possible impact of such factors as the quality of data, or data security, and the contribution that the design of the management accounting system makes in mediating those effects are poorly understood. The study can provide some practical and useful value to the small business markets since it can assist the firms in implementing new and innovative practices. It also contributes to the theoretical knowledge of how the company in Vietnam can modify its management accounting to suit the current data-driven business environment. With the connection of Big Data with management accounting, the research contributes to the practical improvement as well as the scholarly advancement in the sphere.

This study can produce both practical outputs regarding the innovation at the micro-market level and the theoretical knowledge of how Vietnamese companies can integrate their managerial accounting system into the current data-driven landscape. This study aims to gain insights into why it is important to incorporate Big Data into the business analytics tools utilized by MAIS and how this will help Vietnamese businesses make better decisions in the current business environment. The study also highlights the importance of IT infrastructure maturity, including cloud computing, data standardization protocols, and integrated enterprise platforms, which serve as technological enablers for analytics-driven decision-making. It also seeks to discuss how a better management accounting structure can be modified to assist companies to work more efficiently and enhance their performance.

LITERATURE REVIEW

Foundations of Management Accounting Information Systems (MAIS)

Management Accounting Information Systems (MAIS) is a formal process by which companies gather, process, and provide managerial decision-making information through internal accounting. The MAIS usually has a few basic elements, such as data sources (financial and non-financial), accounting programs, data storage, reporting systems, internal controls, and human users (management accountants). With such systems, firms are able to convert raw data into meaningful reports to be used in budgeting, variance analysis, as well as performance measurement. The management accounting had been playing a very backward role. The MAIS was adopted by management accountants to provide the creation of static financial reports, assist in budgeting, control costs, and provide performance evaluation against standards. These traditional systems relied on the past financial information and periodic reports to inform resource allocation and control (Susilawaty and Lubis, 2023).

Discipline and consistency were their main sources of

power; nonetheless, they were not meant for fast, real-time alterations. The drawbacks of these classic MAIS become very visible when the data environment is dynamic. Besides, the classic MAIS might ignore non-financial or external data (like IoT sensor data or social media metrics) and thus, be less relevant to today's decision problems that are rich in data. In the last few years, MAIS have transformed considerably, and the change has been in the direction of systems that are more proactive in managerial decision-making, in terms of incorporating business analytics, big data, and artificial intelligence (Bari & Ara, 2025). Modern MAIS architectures now rely heavily on IT infrastructures such as cloud-based data warehouses, real-time dashboards, automated data pipelines, and ERP-integrated accounting modules, enabling continuous data flows rather than periodic reporting cycles (Barreto *et al.*, 2025). Abbas (2025) stated that AI, machine learning, and generative models are changing the business accounting field by automating everyday processes, improving forecasting, and necessitating accountants to have new data governance and ethics skills.

Understanding Big Data in Contemporary Business Environments

Big Data is a concept that is generally defined by five major aspects: its huge size, different nature, rapid generation, doubtful accuracy, and possible insights. In the fields of accounting and management, big data comprises a wide range of data sources such as sales data, operating figures, customer profiles, system records, social media posts, sensor outputs, and many others. The different types of data are reshaping information transmission in companies; management accountants no longer have to depend on infrequent reports but can now access uninterrupted real-time streams, mixing both internal and external data sources (Barreto *et al.*, 2025). The combination of big data analytics and management accounting results in corporate sustainability through the facilitation of value-added strategic choices (Okafor *et al.*, 2025). On the contrary, Elhoushy *et al.* (2023) share their findings from Egypt proving that these very properties of big data (like high volume or speed) push management accountants into a more strategic position, but at the same time require them to acquire new skills. Li (2021) cautioned against technical risks, which is indicative of the fact that the accounting information systems designed based on big-data platforms might encounter data security and integrity issues. These risks are amplified when firms lack robust IT security frameworks, encryption protocols, and secure cloud infrastructures, elements that determine whether Big Data ecosystems can safely support MAIS operations.

Business Analytics: Tools, Skills, and Organizational Requirements

The role of business analytics in the MAIS area is divided into three categories consisting of descriptive (what happened), predictive (what is likely to happen),

and prescriptive (what should be done) methods. In the area of accounting, organizations are increasingly relying on artificial intelligence, machine learning, and visualization software as their main tools for data analysis and presentation. The data analytics integration results in more accurate management accounting support of strategic decision-making (Wibowo, 2024). Munir *et al.* (2021) argued that the analytics revolution will necessitate the retraining of management accountants with an entirely new skill set that includes statistical modeling, programming, data governance, and partnering with business. The role of the management accountant is changing; he or she is becoming more of a bridge-builder between data scientists and top managers, as well as assisting in interpreting raw data into viable innovation. Aldabbous *et al.* (2024) pointed out that the relevance of appropriate resources, core competencies, and visionary leadership is the foundational key to the success of the implementation of digital initiatives. In developing economies, the resources and skills gap decelerate the incorporation of analytics, and in developed economies, accountants take the data-driven strategies more readily. Modern business analytics depends on IT elements such as cloud-based analytics engines, automated ETL processes, data lakes, and ERP-BI integrations that enable large-scale, real-time processing. Without these systems, analytics adoption remains slow and fragmented, especially in emerging economies (Tran, 2024).

Factors Shaping Effective Business Analytics in Management Accounting

In management accounting, successful business analytics requires a combination of tools and appropriate alignment of technology, data, organizations, and people (Sprakman *et al.*, 2021). Oesterreich and Teuteberg (2019) found that analytics has the ability to enhance the quality of decisions and predictions, but they differ on the requirements to achieve value. Before analytics can deliver value, controllers and management accountants must have new competencies, statistical modelling, data governance, and analytic literacy. Bhimani (2020) warned that it is easy to superficially acquire tools without reconsidering research and practice. This perspective brings out the fact that capability gaps are not necessarily technical, but epistemological. Almushaiqeh *et al.* (2024) discovered that BDA helps to enhance the primary attributes of MAI, including relevance, reliability, and materiality, and the secondary ones, including comparability, timeliness, verifiability, and understandability. This improvement is highly motivated by the five fundamental characteristics of big data, which include volume, variety, velocity, veracity, and value, which aid in deriving insights from varying internal and external data sources. Thanasas and Kapiotis (2024) emphasized that extensive data availability and a culture of data-driven decision making enhance the quality of decisions made by accountants only when the latter have analytics skills to use them. This means that there should be a balanced investment;

investing heavily in the advanced tools without investing the same in the people and processes gives low returns. A key requirement often overlooked in previous studies is the IT readiness of organizations. Factors such as system interoperability, standardized data formats, API-enabled data exchange, and integrated cloud-ERP platforms strongly influence how effectively analytics can be implemented within MAIS.

Impact of Business Analytics on Management Accounting Decisions in the Big Data Context

Analytics enhances forecasting, variance analysis, and timely reporting, which enhances the strength of managerial decisions. Such gains are only possible when there are analytics competencies and governance (Oesterreich & Teuteberg, 2019). Elhoushy *et al.* (2023) discovered that large volume and velocity expand the advisory role of the management accountant, but these features also impose an excessive load on data quality in the team with no data quality control. Duy (2025) emphasized that there is a positive correlation between Big Data implementation and the effectiveness of MAIS, but its small, perception-based sample does not allow making causal statements. The size and speed of Big Data increase the advisory services of accountants, although it may overload the teams that do not have data quality management (Elhoushy *et al.*, 2023). Management accountants serve as transformational intermediaries where companies integrate technical equipment with culture and practice; analytics contributes to innovation and the level of made decisions (Munir *et al.*, 2021). Almushaiqeh *et al.* (2024) stated that it is infrastructure and governance that make analytics meaningfully increase the quality of information and decisions, and not analytics itself. Franke and Hiebl (2022) discovered that quality data sources increase perceived quality of decisions; however, when accountants have analytics skills, and organizations encourage data-driven practices. Recent studies, such as Rahman & Rahman (2025), suggested that decision quality also depends on IT factors such as data integration platforms, cybersecurity maturity, automated anomaly detection systems, and AI-enhanced decision-support modules embedded within MAIS. These digital components strengthen both the reliability and strategic value of Big Data insights.

MATERIALS AND METHODS

The study focuses on the relationship between Big Data and Business Analytics in the context of Management Accounting Systems and, eventually, their effect on the business decision-making process within companies. The study was based on 100 past research works and discovered 53 units related to Big Data merits, 43 units about Business Analytics improving MAIS, and 100 units linked to corporate profit. The study examined the particular conditions under which Big Data had a positive effect on the company's profitability. It took into account 53 previous studies that had been done on the subject of

Big Data and its relationship to the profits of businesses. The use of Big Data nowadays and its deployment have an enormous impact on the profitability of companies, which also includes making successful business decisions.

A u t h o r (Year)	Aim	Methodology	Key results	Conclusion
Amer <i>et al.</i> (2024)	To examine how Big Data and AI are reshaping management control and strategic steering.	Conference chapter; conceptual analysis with illustrative cases.	Argues AI enables real-time monitoring, predictive control, and scenario planning; highlights governance and skills need.	Big Data + AI can renew strategic steering, but success requires governance, infrastructure, and managerial adaptation.
Aboagye-Otchere <i>et al.</i> (2021)	To map and review Big Data research across accounting fields.	Systematic literature review.	Rapid growth in auditing/reporting research; managerial accounting is underrepresented; many conceptual studies.	Calls for more empirical work in management accounting and studies on practical implementation.
Adewale <i>et al.</i> (2024)	To propose analytics and behavioral-finance approaches for optimizing food/FMCG supply chains.	Conceptual / applied review with methodological proposal.	Shows that combining behavioral insights with big-data analytics can improve forecasting and routing decisions.	S u p p l y - c h a i n performance benefits from integrated analytics and behavioral interventions, especially in FMCG contexts.
Ahmad <i>et al.</i> (2024)	To explore energy saving using big data and machine learning in smart homes.	Empirical /engineering study (applied ML experiments).	Demonstrated ML models that reduce energy use via pattern detection and automated control.	Big-data ML solutions can materially improve energy efficiency, with implications for accounting of utility costs.
Alam & Hossain (2021)	To discuss management accounting changes in the digital era.	Conceptual literature review.	Digital tools (ERP, cloud, analytics) shift accounting from reporting to decision support and planning.	Management accountants need digital and analytics competencies to remain relevant.
Al-Okaily & Al-Okaily (2025)	To analyze factors affecting financial decision quality driven by big data analytics.	Empirical: survey and quantitative modeling (SEM suggested by title).	Identifies data quality, analytics capability, and top management support as key predictors.	Strong data governance and analytic maturity are necessary for reliable data-driven financial decisions.
Arnaboldi <i>et al.</i> (2017)	To assess whether social media and big data truly transform accounting or are overhyped.	Critical conceptual analysis.	Raises concerns about reliability, interpretation, and institutional readiness for social/big data.	Big data offers potential but also risks; governance and interpretive capacity are critical.
Arroyo Esteban <i>et al.</i> (2021)	To examine trends and challenges of big data in accounting and international development.	Review and policy/field analysis.	Highlights benefits of transparency and capacity building, but notes infrastructure and skills gaps in developing contexts.	Big data can support development goals, but requires investment in local capabilities and governance.
Bhimani & Willcocks (2014)	To theorize digitization and big data's transformation of accounting information.	F o u n d a t i o n a l theoretical article.	Predicts shifts in accounting roles and processes driven by data scale and automation.	Digitization and big data will reshape accounting; researchers must study institutional and practice changes.

Bose <i>et al.</i> (2023)	To provide an overview of big data, analytics, and AI in accounting.	Book chapter / synthesis.	Summarizes methods (ML, data mining, NLP) and their accounting applications, and highlights challenges.	AI and analytics are reshaping accounting tasks; education and governance must follow.
Chinta <i>et al.</i> (2024)	To link Big Data/ AI-driven ERP systems with cybersecurity resilience.	Conceptual / SSRN working paper (applied frameworks).	Proposes architectures and controls to protect real-time analytics in ERP environments.	Integrating cybersecurity with AI-ERP is essential to protect analytics value and operational continuity.
Dai & Vasarhelyi (2023)	To present the concept of “Management Accounting 4.0.”	Theoretical / conceptual paper.	Describes automation, continuous reporting, and predictive analytics as MA 4.0 features.	Management accounting must transform into intelligent, automated systems supported by new skills.
Egerson <i>et al.</i> (2024)	To examine cybersecurity strategies for protecting big data in BI systems and operational implications.	Applied review / empirical case examples.	Cybersecurity investments preserve BI integrity and positively influence operational efficiency.	Robust cyber strategies are a prerequisite for reliable big-data BI and for safeguarding profitability.
Fahlevi <i>et al.</i> (2021)	To explore roles of big data analytics in DRG-based hospital payment and accounting change.	Qualitative case analysis / sectoral study.	BDA supports cost control and performance under DRG payment; system change affects accounting routines.	Healthcare accounting can be enhanced by analytics, but organizational adaptation is required.
Galeotti <i>et al.</i> (2022)	To assess how big data informs sustainability reporting and non-financial data management.	Thematic / conceptual analysis in a special issue.	Firms increasingly use big data to capture non-financial metrics, but standards and comparability lag.	Big Data can strengthen sustainability reporting if data governance and standards improve.
G a m a g e (2016)	To question whether accounting educators are prepared for big data.	Survey / commentary in education context.	Found gaps in curricula and faculty preparedness for big-data topics.	Accounting education must adopt new training in analytics and data literacy.
Gao (2022)	To analyze enterprise financial accounting information management from a big data perspective.	Conceptual / applied review.	Advocates integrating big data tools to improve data integration and decision support.	Enterprises should modernize accounting information management to leverage big data benefits.
Guo <i>et al.</i> (2024)	To test impact of big-data tax collection on inefficient investment using Golden Tax Project III.	Q u a s i - n a t u r a l experiment / empirical econometric analysis.	Found that stronger big-data tax systems reduced inefficient corporate investment.	Data-driven tax enforcement improves market discipline and investment efficiency.

Heinzelmann (2019)	To discuss digitalizing management accounting and its challenges.	Book chapter / practitioner review.	Covers digital tools' impacts on budgeting, forecasting, and control, and implementation challenges.	Digitalization offers gains but requires change management and skill development.
Herrath & Woods (2021)	To analyze big data impacts on accounting.	Review / commentary.	Highlights opportunities in audit, reporting and decision support; notes ethical and privacy issues.	Big data affects multiple accounting domains and brings governance imperatives.
Ibrahim, Elamer & Ezat (2021)	To identify innovative research opportunities at the convergence of big data and accounting.	Review and research agenda.	Presents research directions including audit analytics, managerial decision models, and governance.	Calls for empirical studies and interdisciplinary approaches.
Jamarani <i>et al.</i> (2024)	To systematically review predictive analytics applications across domains.	Systematic review (AI Review journal).	Catalogs predictive methods and domain applications, highlighting trends and gaps.	Predictive analytics is mature in some areas but needs more domain-specific validation in accounting.
Munir <i>et al.</i> (2022)	To examine how BDA capabilities and organizational culture affect innovation and the role of management accountants.	Quantitative survey and SEM.	Analytics capabilities promote innovation when supported by culture and accountant involvement.	Investments in analytics must be paired with cultural and capability development.
Nielsen (2022)	To study exploratory data analysis and unsupervised ML in management accounting.	Literature study and methodological discussion.	Identifies clustering and anomaly detection as useful for cost/variance analysis and fraud detection.	Unsupervised methods expand accounting insight but require methodological rigor and interpretive skill.
Nielsen (2020)	To introduce the idea of machine learning in management accounting.	Conceptual / early review.	Posits ML can automate pattern detection and support forecasting in accounting tasks.	ML offers new analytic opportunities, with attendant needs for oversight and validation.
Oesterreich & Teuteberg (2019)	To explore how business analytics changes competence profiles of controllers and management accountants.	Survey of professionals with statistical analysis.	Found rising demand for analytics, data governance and IT skills among controllers.	Training and role redefinition are necessary to embed analytics into control functions.
Pilipczuk (2020)	To propose cognitive management accounting approaches.	Conceptual paper (Sustainability).	Advocates integrating cognitive frameworks to improve managerial interpretation of analytics.	Cognitive perspectives can enrich accounting decisions in data-rich environments.

Rahaman <i>et al.</i> (2024)	To compare big-data decision making approaches in project management.	Comparative analysis / applied study.	Shows Big Data improves project monitoring and risk assessment across cases.	Project management benefits from data-driven processes but requires integration efforts.
Richins <i>et al.</i> (2017)	To debate whether big data analytics is opportunity or threat for accounting profession.	Conceptual and review study.	Notes automation threatens some traditional roles but creates new advisory opportunities.	The profession must adapt by embracing analytics and redesigning roles.
Shi (2021)	To analyze asset structure and profitability using cloud computing and strategic management accounting.	Empirical analysis (PLOS ONE).	Cloud and strategic accounting approaches linked to improved asset management and profitability indicators.	Cloud adoption and strategic management accounting can positively affect performance.
Spraakman, Sanchez-Rodriguez & Tuck-Riggs (2021)	To study how management accountants perform data analytics in practice.	Qualitative interviews / case studies.	Accountants engage in descriptive analytics and are expanding into predictive roles, but report skill gaps.	Practical uptake is growing, but firms must invest in training and cross-functional collaboration.
Sun (2024)	To research big data technology in cloud accounting for financial decision-making.	Applied conceptual / case evidence.	Cloud accounting plus big data improves forecasting, real-time reporting and decision speed.	Cloud ecosystems enable better financial decisions when underpinned by quality data and governance.
Toromade <i>et al.</i> (2024)	To examine technological innovations in accounting for food supply chains.	Applied review / industry case evidence.	Innovations (traceability, analytics) enhance cost control and risk management in food chains.	Sector-specific analytics deliver tangible operational and accounting benefits.
Varma, Piedepalumbo & Mancini (2021)	To perform a bibliometric study of big data and accounting research.	Bibliometric analysis of publications and citations.	Growth in publications mostly in auditing and information systems; managerial accounting less covered.	The bibliometric landscape supports targeted calls for managerial accounting research.
Wang & Wang (2016)	To discuss integrating data mining into managerial accounting systems.	Conceptual / early applied discussion.	Data mining offers pattern discovery and forecasting benefits but poses implementation challenges.	Data mining should be adopted with process redesign and skills investment.
Yang <i>et al.</i> (2024)	To show how big data and AI drive customer insights and risk analysis in financial services.	Applied study / sectoral analysis.	AI enhances customer analytics and risk scoring, improving product targeting and credit decisions.	Financial services gain competitive advantage with integrated big-data AI systems, subject to compliance.

Yoshikuni <i>et al.</i> (2024)	To study knowledge management, strategic management accounting, and organizational ambidexterity.	Empirical study (likely survey / structural modeling).	Knowledge processes and SMA practices mediate operational processes to foster ambidexterity.	Strategic accounting processes combined with knowledge management support adaptive dual capabilities.
Gamage (2016)	Investigate whether accounting educators are prepared for the Big Data era.	Survey and education-focused analysis.	Identifies major gaps in curriculum content and faculty big-data skills readiness.	Accounting programs must integrate analytics, data mining & technological competencies.

43 prior researchers who have studied the management accounting information system and its connection to the company's Big Data have been discovered by the study.

It demonstrated the exact and favorable correlation between the two previously indicated criteria during these instances. The initial information was gathered via

Author / Year	Aim	Methodology	Key Results	Conclusion
Bhimani (2020)	Examine impact of digital data on MA research methods	Conceptual / Literature review	Traditional methods insufficient; digital data needs new research approaches	MA research needs methodological adaptation for big data and digital contexts
Quinn <i>et al.</i> (2014)	Explore effects of cloud technology on MA and decision-making	Empirical / Case study	Cloud computing enhances access to data, improves decision speed and flexibility	Cloud technology positively transforms MA practices, but adoption varies
Strauss <i>et al.</i> (2015)	Examine cloud technology's effect on MA and decision-making	Empirical / Case study	Reinforces cloud improves efficiency and data-driven decisions	Cloud adoption supports better decision-making and process efficiency in MA
Ibrahim <i>et al.</i> (2021)	Review disruptive technologies in accounting	Systematic literature review	Cloud, big data, AI, blockchain impact accounting practices	Disruptive technologies require adaptation in skills, processes, and education in accounting
Nielsen (2015)	Investigate impact of business analytics on management accounting	Conceptual / SSRN working paper	Business analytics enhances forecasting, budgeting, and performance measurement	Analytics strengthens MA decision support but requires skilled interpretation
Wang <i>et al.</i> (2024)	Explore blockchain, digital identity, and data security in accounting	Conceptual / Technical analysis	Blockchain ensures secure digital identity and trust in MA processes	Blockchain enhances secure, trustworthy, and automated accounting processes
Wang <i>et al.</i> (2020)	Risk analysis in MA using big data association rules	Quantitative / Data mining	Identified key risk patterns in enterprise MA	Big data improves risk assessment and supports better MA decisions
Ke & Shi (2014)	Discuss the impact of big data on financial management	Conceptual discussion	Big data transforms reporting, auditing, and decision-making	Accounting practices must evolve to handle larger, complex datasets
Warren <i>et al.</i> (2015)	Examine how big data will change accounting	Conceptual analysis	Big data requires new skills and changes traditional accounting roles	Accountants need analytical and strategic capabilities; technology alone is insufficient

K u r i l a (2016)	Examine role of big data in Finnish companies' management accounting	Exploratory / Case study	Companies increasingly use big data for decision-making	Big data adoption influences MA strategy and performance
C o k i n s (2016)	Identify top trends in management accounting	Conceptual / Trend analysis	Highlights digitalization, analytics, process automation	MA trends require adaptation to technology-driven data and processes
Janvrin & W a t s o n (2017)	Explore "Big Data" impact on accounting	C o n c e p t u a l discussion	Big data enhances insight generation, but challenges in analysis remain	Accountants must develop analytical skills and embrace data-driven decision-making
Gärtner & Hiebl (2017)	Discuss issues and challenges with big data	Conceptual / Literature review	Data quality, privacy, and integration challenges identified	Organizations need robust governance and skilled staff for effective big data use
T a i p a l e - e n m ä k i (2017)	Investigate agile management accounting practices	Research note / Conceptual	Agile MA improves adaptability and responsiveness	Agile principles enhance MA flexibility and decision-making speed
Li (2019)	Study MA teaching using cloud accounting under big data	Case study / Applied research	Cloud accounting improves learning and analytical capability	Cloud-based teaching supports development of MA competencies in big data environments
Möller <i>et al.</i> (2020)	Outline digitalization in MA and control	Editorial / Conceptual	Highlights trends, gaps, and research directions in MA digitalization	Calls for empirical research to understand digital MA practices
Geddes, B. H. (2020)	Examine emerging technologies in management accounting	C o n c e p t u a l / Literature discussion	Identifies AI, analytics, and digital tools as key enablers	Emerging technologies transform MA practices and decision-making
Korhonen <i>et al.</i> (2021)	Study automation in MA tasks	Interventionist case study	Certain tasks are programmable; human expertise still required	Automation reshapes MA work but accountants remain crucial
Balios (2021)	Examine big data impact on accounting and auditing	Conceptual / Review	Big data affects auditing quality, financial reporting, and decision-making	Big data adoption is crucial for modern MA and auditing
Sarigiannidis <i>et al.</i> (2021)	E v a l u a t e environmental MA systems using business intelligence	A p p l i e d framework / Conference study	BI technologies improve environmental accounting effectiveness	Smart frameworks enhance sustainability-focused MA decisions
McBride & Philippou (2022)	Examine big data and analytics in accounting education	Survey / Case study	Analytics in masters courses improves MA competency	Big data integration strengthens MA education and decision-making skills
Mansoor <i>et al.</i> (2022)	Investigate trends in managerial accounting under digitalization	Conference / Conceptual study	Digital tools, big data, and automation reshape MA	Managers and accountants must adapt to evolving MA technology
Nik Abdullah <i>et al.</i> (2022)	Explore big data in strategic MA practices	Case study	Big data enhances strategic decision-making in manufacturing	Big data integration supports strategic MA and operational efficiency

Mahlendorf <i>et al.</i> (2023)	Study innovative data use in MA research and practice	Literature & applied case analysis	New data use-cases improve decision-making and process efficiency	MA must adopt innovative data-driven methods for effectiveness
Dai & Vasarhelyi (2023)	Define Management Accounting 4.0	Conceptual / Framework development	Integration of AI, automation, real-time analytics	MA must evolve toward digital and real-time decision support
Franke & Hiebl (2023)	Assess analytics skills impact on decision quality	Empirical / Survey	Skilled accountants interpret data more effectively	Human expertise is critical alongside technology in MA decisions
Odonkor <i>et al.</i> (2024)	Review US MA evolution and methodology shifts	Literature review	MA tools and methods have evolved with technology	Understanding trends helps adapt MA to current business needs
Sun <i>et al.</i> (2024)	Study impact of big data on accounting and auditing	Review / Conceptual	Big data changes reporting, auditing, and decision-making	Accounting practices must adapt to big data era
Shalhoob <i>et al.</i> (2024)	Investigate big data analytics for error and fraud detection	Empirical / Quantitative analysis	Big data improves error detection and fraud prevention	Analytics enhances accuracy and trust in MA systems
Zuhroh <i>et al.</i> (2024)	Examine sharing economy platforms and MA usage in MSMEs	Empirical study / Survey	Platform-based MA systems improve performance during COVID-19	Digital MA tools help MSMEs maintain resilience and efficiency
Fang <i>et al.</i> (2024)	Develop big data-enabled safety system for construction	Applied research / Case study	Analytics identifies unsafe behaviors in real-time	Big data enhances operational safety and MA reporting in construction
Guo <i>et al.</i> (2024)	Examine influence of business analytics on MA informatization	Applied research / Quantitative	Analytics improves MA decision-making and process informatization	Business analytics strengthens data-driven MA decisions
Rautiainen <i>et al.</i> (2024)	Study management accountant role identity in digital era	Case study	Accountants adopt fluid roles balancing analysis and advisory	MA roles are evolving toward flexible, advisory, and analytical functions
Abdelhalim (2024)	Study integration of MA practices with big data for sustainability	Empirical / Quantitative	Big data improves sustainability-focused MA decisions	Integration of analytics strengthens corporate sustainability initiatives
Theodorakopoulou <i>et al.</i> (2024)	Explore big data implications in accounting	Conceptual / Review	Identifies opportunities and challenges of big data adoption	Organizations must address governance, technology, and skills for effective MA
Shchyrba <i>et al.</i> (2024)	Investigate latest MA technologies and ChatGPT capabilities	Conceptual / Review	AI tools can support MA processes, forecasting, and reporting	Emerging AI technologies provide new MA tools, requiring skill and adaptation

surveys conducted with Vietnamese companies, in the 2025 financial year, that were not part of multinational corporations or large domestic companies. A self-administered questionnaire aimed at getting quantitative responses on a 5-point Likert scale with 1 (strongly disagree) to 5 (strongly agree) was used. The data went through SPSS for analysis. Reliability checking was conducted through Cronbach's Alpha, with values of 0.6 and above considered acceptable for exploratory research. Item-total correlations of 0.3 or higher were used to assert

the observed variables' consistency. Exploratory Factor Analysis (EFA) was performed for construct validity assessment, supported by Kaiser-Meyer-Olkin (KMO) measure, Bartlett's test of sphericity, and Eigenvalues which confirmed factor structure adequacy. T-tests were used to compare the means of samples with test values and further support the hypothesis testing process. The business entities picked were grouped based on their ownership forms, encompassing FDI and Vietnamese firms conducting business in 2025. Both local and

international investment firms in significant regions such as Northern, Central, and Southern Vietnam were part of the study. A non-probability sampling method was utilized, employing a class-based sampling strategy to portray the various investor groups in the Vietnamese market. When evaluating the sample's characteristics, respondents' gender, educational attainment, and occupation were also taken into account. Standard sampling criteria with a 5% margin of error and a 95% confidence level were used to get the overall sample size. The data was analyzed using the Statistical Package for Social Sciences (SPSS), and reliability tests were then carried out.

This research synthesized previous studies to evaluate the impact of Business Analytics on Modern Management Accounting Informatization Decisions during the Big Data era as described in Accounting and Corporate Management (2024). The researchers analyzed 100 studies

published from 2000 to 2024, and the review revealed that only a few empirical studies have been conducted on this topic in Vietnam, thus creating a significant contextual research gap. The study builds its research framework on the existing literature which includes one independent variable (Big Data-driven business analytics tools) and one dependent variable (management accounting decision effectiveness). Table 1 depicts the current influence of Big Data on business analysis in the context of Management Accounting Information Systems (MAIS). Additionally, the framework supports since MAIS leads to more accurate, timely, and data-driven managerial decisions.

Table 1. 's model depicts again the Influence of Business Analytics on Modern Management Accounting Informatization Decision under the Background of Big Data (Guo, 2024)

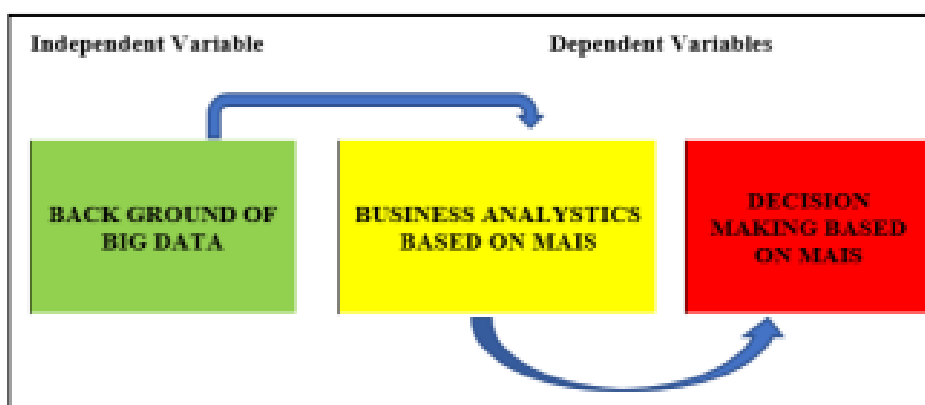


Table 1: Null Research Hypotheses (Ho).

H01	Big Data does not impact the effectiveness of business analytics in management accounting for decision making.
H02	Business analytics tools of management accounting driven by Big Data do not impact business decision making in management accounting.

Study Hypothesis

Statistical Analysis

Quantitative data were collected by means of a self-administered questionnaire. The respondents were given the opportunity to express how much they agreed with each statement using a 5-point Likert scale, where 5 indicated strong agreement and 1 indicated strong disagreement. For the purpose of reliability testing, a Cronbach's Alpha value of 0.6 or higher is considered to be acceptable in exploratory studies, while higher values indicate that the scale is more reliable. A T-test was applied to make a comparison between the mean scores and to see if the responses were significantly different from the expected value. Moreover, the KMO measure, Bartlett's test of sphericity, and Eigenvalues in Exploratory Factor Analysis (EFA) were among the statistical test applied to confirm that the data was suitable for factor analysis and that the research model was statistically sound.

RESULTS AND DISCUSSION

Sample Characteristics

The non-probability sampling technique was employed in the study. In selecting the participants, eight basic criteria were used. The study aimed at understanding the influence of Big Data on business analysis in management accounting and decision-making by exploring three independent variables and five dependent variables. The minimum number of surveys for dependable analysis was 40 (calculated as 8×5), and the research was able to successfully gather 81 responses online. According to sample statistics, a majority of the participants were younger than 30 years and had work experience of less than five years. Another point raised by the researchers is that most of the companies surveyed have their major capital sources from Vietnamese investors.

Research Variables

Data Analysis and Findings

Cronbach Alpha Testing

The study continues to assess its research data by

analyzing the reliability of the eight research variables that demonstrate the relationship between Big Data, MAIS' Business Analytics, and MAIS' business decisions. The data values are provided as 0.633 and 0.776 in the

Table 2: Description of Research Objectives

No.	Research Items		Researching %
1	Gender of the survey subject	Female	22.5%
		Male	77.50%
2	Age of survey subjects	Under 30 years old	73.30%
		Over 30 years old	26.70%
3	Current duration of employment's background	Less than	77.30%
		5 years of practical accounting	
		Over 5 years of practical accounting experience	22.70%
4	Current working location	South of VN	93.30%
		The rest ones	16.60%
5	Nature of the industry	Production	5.70%
		Trading	21.30%
		Others	73%
6	The capital structure	100% Vietnamese	64.80%
		100% foreign investment	8%
		Join venture with FDIs	10.20%
		Other	17.00%

Table 3: Description of Research Variables

No	Classification	Researching Questionnaires	References
		Independent Research Variables	
H012	Advanced analysis tools	Management accountants can quickly and efficiently evaluate and gain insights from big data using data analytics techniques.	Zongying Guo, 2024
H013	Clarity of decision requirements	Applying management accounting tools requires managers to understand the organization's development plans and goals in order to make decisions and evaluate arising difficulties as well as final business results.	Zongying Guo, 2024
H014	Data Quality Assurance	Data quality assurance is the basis for management accounting to use business analysis learning to carry out information decision-making.	Zongying Guo, 2024
Dependent Research Variables			
H021	Strengthen data security and privacy protection	Management accounting information decision-making using business analysis domain knowledge requires data protection.	Zongying Guo, 2024
H022	Improve decision-making efficiency	Management accounting can analyze financial data using business analysis skills and data analysis tools to make decisions faster.	Zongying Guo, 2024

H023	Improve decision-making accuracy	Phased learning using data models ensures reliable mathematical model analysis, helping management accounting predict industry and enterprise growth.	Zongying Guo, 2024
H024	Strengthen risk management	Business analytics may also evaluate decision plans, give decision reference data, and help enterprise managers make scientific and successful decisions.	Zongying Guo, 2024
H025	Improving IT application	A big data platform, information system, and data analysis technologies assist management accounting acquire, sort, analyze, and process financial data.	Zongying Guo, 2024

references of Tables 05.02 and 06.02. The research variables in its module are considered reliable for the succeeding phases of the investigation (Hair, 2009).

EFA Testing (Independent Variables)

Mean Testing

The study clarified the need to utilize mean testing. Their

testing results are detailed in the Descriptive Statistics of Table 09. The average mean constantly exceeds 4.000, signifying that the interviewers' viewpoints correspond with the impacts of Big Data on MAIS's business analytics and its successful decision-making.

Table 4: Cronbach Alpha Testing for Ho1 (Independent Research Factors)

Case Processing Summary		
Cases	N	%
Valid	81	98.8
Excluded	1	1.2
Total	82	100

a. Listwise deletion based on all variables in the procedure.

Table 5: Reliability Statistics

Cronbach's Alpha	N of Items
0.633	3

Table 6: Item-Total Statistics

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H012	8.5309	1.202	0.486	0.476
H013	8.4691	1.202	0.482	0.481
H014	8.5556	1.225	0.367	0.646

Table 7: Cronbach Alpha Testing for Ho1 (Dependent Research

Case Processing Summary			
	N	N	%
Cases	Valid	81	98.8
	Excluded	1	1.2
	Total	82	100.0

a. Listwise deletion based on all variables in the procedure

Table 8: Reliability Statistics

Cronbach's Alpha	N of Items
0.776	5

Table 9: Item-Total Statistics

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H021	16.9630	4.461	0.530	0.742
H022	17.0123	3.862	0.580	0.726
H023	16.9630	4.311	0.569	0.729
H024	16.9383	4.309	0.510	0.748
H025	16.8642	4.269	0.567	0.730

Table 10: KMO's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.627
Bartlett's Test of Sphericity	Approx. Chi-Square	31.524
	df	3
	Sig	.000

Table 11: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.745	58.159	58.159	1.745	58.159	58.159
2	.732	24.413	82.572			
3	.523	17.428	100.000			

Extraction Method: Principal Component Analysis.

In the sub-conclusion, the study evaluates the efficacy of its research module regarding the independent variables presented in Table 3.3.2.1. The results indicate a

KMO of .627 (> 0.5), a significance level of .0, and a cumulative percentage of eigenvalues of 58.159 % ($\geq 50\%$). Consequently, all tested results are validated, confirming that the research module is sound with respect to its independent variables, and it persuades us to continue our efforts from this point onward.

Table 12: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.701
Bartlett's Test of Sphericity	Approx. Chi-Square	107.948
	df	10
	Sig	.000

Table 13: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.651	53.011	53.011	2.651	53.011	53.011
2	.834	16.676	69.687			
3	.643	12.865	82.552			
4	.561	11.219	93.771			
5	.311	6.229	100.000			

Extraction Method: Principal Component Analysis.

Moreover, the sub-conclusion evaluates the performance of the investigation module in relation to the dependent variables specified in Tables 08.1 and 08.2. The findings show a KMO of 0.701 (> 0.5), a significance level of 0.0, and a cumulative percentage of eigenvalues of 53.011% ($\geq 50\%$). Thus, all inferences made are confirmed, and it is declared that the investigation module is strong in terms of its independent variables, and it encourages us to continue our efforts from this point onwards.

T-One Testing

Additionally, T-One Testing has been utilized in the research to corroborate the precision of its ideas. Upon reviewing the research testing results, with a significant

(2-tailed) value of .000 from Table 10.02 of the One-Sample Test, we must conclude that the null research hypotheses, Ho1 and Ho2, will be rejected.

Table 14: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
H011	81	1.00	5.00	4.3086	.75236
H012	81	3.00	5.00	4.2469	.64286
H013	81	3.00	5.00	4.3086	.64502
H014	81	2.00	5.00	4.2222	.70711
H021	81	3.00	5.00	4.2222	.63246
H022	81	1.00	5.00	4.1728	.78724
H023	81	3.00	5.00	4.2222	.65192
H024	81	2.00	5.00	4.2469	.69876
H025	81	3.00	5.00	4.3210	.66759
Valid N (listwise)	81				

CONCLUSION

The Cronbach Alpha value of the eight researched variables was greater than 0.6 (Hair, 2009), thus the measurement scales are proven to be reliable. The one-

sample test results indicate that the significant (2-tailed) values of 0.000 are significant and result in rejection of null hypotheses H01 and H02. The results of EFA

Table 15: One-Sample Statistics

Variable	N	Mean	Std. Deviation	Std. Error Mean
H012	81	4.2469	0.64286	0.07143
H013	81	4.3086	0.64502	0.07167
H014	81	4.2222	0.70711	0.07857
H021	81	4.2222	0.63246	0.07027
H022	81	4.1728	0.78724	0.08747
H023	81	4.2222	0.65192	0.07244
H024	81	4.2469	0.69876	0.07764
H025	81	4.3210	0.66759	0.07418

a. *t cannot be computed because the sum of case-weights is less than or equal to 1.*

b. *t cannot be computed. There are no valid cases for this analysis because not all case weights are not positive.*

Table 16: One-Sample Test

Test Value = 3.41						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H012	11.717	80	.000	.83691	.6948	.9791
H013	12.539	80	.000	.89864	.7560	1.0413
H014	10.338	80	.000	.81222	.6559	.9686
H021	11.558	80	.000	.81222	.6724	.9521
H022	8.721	80	.000	.76284	.5888	.9369
H023	11.213	80	.000	.81222	.6681	.9564
H024	10.779	80	.000	.83691	.6824	.9914
H025	12.281	80	.000	.91099	.7634	1.0586

also indicate the validity of research constructs. These results show that Big Data contributes greatly to business analytics in the context of MAIS, which, in turn, increases the effectiveness of decision-making among Vietnamese companies. It is also found that IT-enabled infrastructures such as cloud-based accounting systems, automated data pipelines, and real-time dashboards are important as well. In spite of these contributions, the study failed to provide

a clear explanation on how exactly the Big Data enhances performance using MAIS. Thus, the subsequent studies should consider SMEs, use causal research designs, and test IT-oriented frameworks like the cloud system, AI analytics, RPA, cybersecurity, and IT governance. The research is also confined to Vietnamese companies, is based on self-reported information, and employs a rather small sample, which could impact the generalization. The

future research ought to compare other countries and the level of maturity of accounting systems in order to enhance external validity.

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