

# MAPs' Inference Capability: The Mediating Role between BI&A and Organisational Performance

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## ABSTRACT

*Business Intelligence and Analytics (BI&A) has become pivotal in enhancing organisational decision-making, yet its integration with management accounting practices (MAPs) remains underexplored. This study investigates the influence of BI&A integration on MAPs' inference capability and examines the extent to which this capability mediates the relationship between BI&A utilisation and organisational performance. Adopting a quantitative exploratory approach, this study analyses 192 usable survey responses from financial professionals in medium and large organisations in the UAE. The study demonstrates that BI&A use significantly augments the inference capability of MAPs, which, in turn, fully mediates the association with organisational performance. These findings emphasise that effective BI&A implementation requires strategic alignment with MAPs' capabilities to yield performance improvements. This paper contributes to the literature by empirically demonstrating the role of MAPs' inference capability in translating technological capabilities into organisational value in emerging economies.*

*Keywords: Business intelligence and analytics; management accounting practices; organisational performance; mediation; UAE.*

## INTRODUCTION

The last two decades have witnessed a technological revolution that has infused the corporate environment and significantly impacted accounting information systems. In the UAE, this digital transformation has been particularly pronounced, with organisations investing heavily in technology as part of the country's Vision 2025 initiative to become a knowledge-based economy (UAE Government Strategy 2023). For example, firms invested over USD 3.47 billion in 2023, and this figure is predicted to increase by 43.9% between 2024 and 2030 (KPMG 2024). Despite substantial investments in Business Intelligence and Analytics (BI&A), UAE firms struggle to realise tangible returns from these implementations (Farhan et al. 2017), highlighting a critical disconnect between technology adoption and performance improvement.

This challenge is particularly evident in management accounting practices (MAPs), as the integration of BI&A with traditional accounting processes remains fragmented and poorly understood (Abdelhalim 2024). The traditional role of MAPs, such as cost accounting, value generation, and performance evaluation, is being fundamentally reshaped by BI&A capabilities (Kalifa et al. 2023). However, the degree of enhancement and the specific mechanisms through which BI&A enhances MAPs' inference capabilities remain largely unexplored, particularly in the UAE context. This gap is significant, as organisations may adopt BI&A technologies that are misaligned with their management accounting objectives, leading to inefficient resource allocation and suboptimal strategic decisions (Awadallah 2024). The UAE provides an ideal context for this study for several reasons. First, it represents one of the most technologically advanced economies in the Middle East, with significant investments in digital transformation across industries. Second, the UAE's Vision 2025 initiative explicitly emphasises data-driven decision making, creating a natural laboratory for examining BI&A implementation. Third, the UAE's diverse economic base, spanning financial services, logistics, tourism, and manufacturing, allows for examination of BI&A and MAPs across various industry contexts. Finally, the limited research on MAPs in Gulf Cooperation Council (GCC) countries provides an opportunity to expand the geographical scope of the literature.

Recent research has examined various aspects of BI&A's impact on organisational performance (Bordeleau et al. 2020), focusing on business process change capabilities (Elbashir et al. 2023) and BI&A types and capabilities (Ramakrishnan et al. 2023). However, there is a notable lack of investigation into the influence of BI&A on firm performance, specifically through the lens of MAPs' inferential capabilities. Despite substantial investments in BI&A technologies, many UAE organisations struggle to translate these investments into improved performance outcomes. This disconnection represents a critical research gap; while the technological aspects of BI&A implementation have been studied extensively, the specific mechanisms through which BI&A enhances organisational performance, particularly through MAPs, remain poorly understood. This study bridges the gap by investigating the mediating role of MAPs' inferential capabilities in the association between BI&A utilisation and organisational performance in the UAE context. This gap is especially salient in the UAE, as organisations are rapidly adopting advanced analytics solutions while still maintaining traditional MAPs (Aljumah et al. 2022). This study addresses these gaps by investigating three critical aspects:

1. the influence of BI&A integration on MAPs' inferential capabilities in UAE organisations

2. the extent to which these enhanced capabilities mediate the association between BI&A utilisation and organisational performance, and
3. the specific contextual factors in the UAE business environment that affect this relationship.

By examining these aspects, this research provides crucial insights for both practitioners and researchers into the effective use of BI&A investments to enhance MAPs and, ultimately, improve organisational performance.

The study offers several unique contributions. First, it provides empirical evidence of the specific mechanisms through which BI&A enhances MAPs' inferential capabilities in the UAE context. Second, it develops a framework for understanding the translation of these enhanced capabilities into improved organisational performance. Third, it offers practical guidelines for UAE organisations on optimising their BI&A investments within MAPs. The following section establishes a strong foundation for this study by reviewing existing literature on BI&A, MAPs, and their impact on organisational performance, leading to the development of key hypotheses.

## LITERATURE REVIEW

The research model is grounded in the Resource-Based View (RBV) theory, which provides a compelling framework for understanding the association between BI&A, MAPs, and corporate performance. From an RBV perspective, sustained competitive advantage is achieved when an organisation possesses resources and capabilities that are valuable and rare, and that competitors cannot readily imitate or replace. RBV provides a robust theoretical foundation for understanding performance differences in organisations' BI&A implementations, as it emphasises the importance of both possessing valuable resources and the capability to deploy them effectively (Wade & Hulland 2021). In this study, BI&A represents technological resources that organisations invest in, while MAPs' inference capability embodies the unique organisational capabilities that leverage these resources.

RBV is particularly appropriate for this study, as it supports the argument that BI&A enhances MAPs' capabilities in several ways. It explains that mere investment in BI&A technology is insufficient for performance improvement; organisations must develop complementary capabilities to extract value from these investments. Furthermore, RBV's emphasis on resource complementarity illuminates the synergistic relationship between BI&A and MAPs: BI&A provides analytical capabilities, while MAPs provide the business context necessary for translating data insights into actionable decisions (Johnson & Smith 2023). Third, RBV helps explain performance variations among organisations with similar technological investments, focusing attention on the differential capabilities that enable some organisations to achieve superior outcomes.

This theoretical lens has been successfully applied in prior analytics research (Aydiner et al. 2019; Elbashir et al. 2021), with BI&A representing technological resources and MAPs' inference capability embodying the organisational capabilities that transform these resources into competitive advantage (Peters et al. 2016; Rikhardsson & Yigitbasioglu 2018; Dahal et al. 2024). The performance construct represents the ultimate organisational outcomes, consistent with RBV-based studies linking analytics capabilities to performance (Oesterreich et al. 2019; Youssef & Mahama 2021). This theoretical framework effectively explains organisations' achievement of superior performance through the combination of technological resources with distinctive capabilities in ways that are not easily replicated by competitors (Peteraf & Barney 2003).

## BI&A AND MAPS

MAPs are forms of decision support, and BI&A technologies are advanced tools for digitising this process. BI&A plays a critical role in control, planning, cost management, and performance management activities, which have been shown to enhance organisational effectiveness and, consequently, improve overall performance (Peteraf & Barney 2003; Barreto et al. 2025). BI&A tools offered by major software providers such as SAP, Oracle, IBM, and Microsoft contain specialised functions that directly support management accounting activities (Rikhardsson & Yigitbasioglu 2018). These tools enable efficient data consolidation, improve data quality, and provide customisable reporting capabilities (Youssef & Mahama 2021). More advanced functions include forecasting and modelling capabilities that facilitate predictive and prescriptive analytics, moving management accounting beyond historical reporting toward future-oriented decision support (Barreto et al. 2025). Real-time data tracking, interactive visualisation, and in-depth analysis features further enhance decision-making processes (Spraaakman et al. 2020). The ability to perform what-if, sensitivity, and goal-seeking analyses provides valuable insights for strategic planning (Geddes 2020). Additionally, mobility features and rapid insight capabilities allow management accountants to access and analyse data flexibly across devices, supporting timely and informed financial decision-making throughout the organisation (Rikhardsson & Yigitbasioglu 2018). These functionalities are becoming increasingly vital to the execution of various MAPs, particularly in terms of their implications for the quality of MAP outputs. In other words, BI&A's aforementioned features affect the ability of MAPs to generate more reliable information and, thus, more reliable decisions; however, this must be evaluated.

Synthesising existing research reveals three primary patterns in the relationship between BI&A and MAPs. First, BI&A has demonstrated significant impact on reporting and analysis functions but more limited effects on traditional budgeting processes (Spraaakman et al. 2020; Youssef & Mahama 2021). Second, the effectiveness of BI&A implementation depends

on organisational factors, including data infrastructure sophistication and management emphasis on planning functions (Bergmann et al. 2020). Third, while BI&A enhances specific MAPs, such as key performance indicator monitoring, its adoption of more complex techniques, such as activity-based costing and balanced scorecards, remains inconsistent (Nawawi et al. 2020; Barreto et al. 2025).

The connection between MAPs and BI&A has been studied in many aspects or domains, including management control systems (Gomez-Conde et al. 2019; Elbashir et al. 2021; Marx et al. 2012); organisational performance (Appelbaum et al. 2017; Adu-Gyamfi & Chipwere 2020; Elbashir et al. 2011); process improvement and value creation (Bronzo et al. 2013; Ahmed et al. 2019; Elbashir et al. 2013); BI&A adoptions challenges (Kowalczyk & Buxmann 2015); and sustainability-oriented accounting (Petrini & Pozzebon 2009). However, these studies have typically focused on specific applications rather than developing an integrated understanding of BI&A's transformation of MAPs' fundamental capabilities.

A critical research gap emerges from this analysis. Despite growing recognition of BI&A's importance in the management accounting context, few studies have examined the influence of BI&A on the inferential capabilities of MAPs; their ability to derive meaningful insights from financial and operational data. This gap is particularly significant given that organisations invest substantially in BI&A technologies but often struggle to achieve corresponding performance improvements, suggesting that intervening capabilities play a crucial role in translating technological investments into organisational outcomes (Appelbaum et al. 2017; George et al. 2020; Rikhardsson & Yigitbasioglu 2018).

BI&A provides outstanding support to management accountants in terms of cost reduction and efficiency, timely information such as cost and revenue forecasting, production change impact analysis, product profitability analysis, and data-driven opportunities for value creation (Lee & Park 2005; Möller et al. 2020; Pickard & Cokins 2015). It is also used to efficiently predict business segments by assessing the profit contribution of customer segments (Mikalef et al. 2018; Bronzo et al. 2013). BI&A is increasingly applied in performance management by generating performance-related information that supports more targeted and coordinated actions (Vukšić et al. 2013). Although BI&A influences business process performance, management control, and organisational performance, it is critical that it be assimilated through shared knowledge and top management support (Bronzo et al. 2013; Rikhardsson & Yigitbasioglu 2018). Peters et al. (2016) have advanced a comprehensive perspective on the effectiveness of BI&A technology-enabled systems when employed for performance evaluation and balanced scorecards. However, research by Peters et al. (2016) suggests that the efficiency of BI&A in improving performance measurement relies on factors including measurement quality, analysis capabilities, and integration with management control systems.

Recent accounting and information systems research increasingly shows that the association between BI&A and organisational performance is context-dependent, rather than arising from a simple direct relationship. While early studies emphasised BI&A as a technological asset, more recent evidence highlights that performance outcomes depend on the extent to which analytics are embedded within management accounting processes (Steens et al. 2024; Arkhipova et al. 2024). Empirical findings from recent studies report inconsistent performance effects of BI&A adoption, particularly in accounting contexts in which analytics are not effectively integrated into decision-making routines (Mahlendorf et al. 2023; Rautiainen et al. 2024).

This literature suggests that BI&A should be understood as part of an organisational capability system. In management accounting settings, value is created when analytical outputs are interpreted, contextualised, and translated into actionable insights through inference and professional judgment (Arkhipova et al. 2024). Extant literature suggests that BI&A influences corporate performance across four organisational performance dimensions: financial, customer, internal process, and learning and growth. From a financial perspective, BI&A enhances profitability and cost efficiency through improved financial analysis and forecasting. In customer terms, analytics enable a better understanding of customer behaviour and service quality. BI&A also strengthens internal process performance by supporting process optimisation, coordination, and control. Finally, BI&A contributes to learning and growth by enhancing organisational knowledge, analytical skills, and decision-making capabilities within management accounting functions (Bhimani & Willcocks 2014; Nielsen 2018; Franke & Hiebl 2023; Arkhipova et al. 2024).

Accordingly, this study examines the extent to which BI&A use, conceptualised as a multi-module/tool construct, affects the inferential capability of four categories of MAPs: (1) cost determination and financial control, (2) information provision for managerial planning and control, (3) waste reduction in organisational resources, and (4) effective resource utilisation. On this basis, the following hypotheses are proposed:

H<sub>1</sub> BI&A positively influences OP.

H<sub>2</sub> BI&A positively influences MAPs' inference capability.

#### MEDIATING EFFECT OF MAPS INFERENCE CAPABILITY

The inference capability of MAPs refers to the ability to derive meaningful insights and conclusions from accounting data to enhance decision-making processes, as synthesised from Appelbaum et al. (2017) and Schneider et al. (2015). This capability represents a crucial link between technical analytics and organisational performance, potentially explaining differences in the returns that organisations achieve from their BI&A investments. Schneider et al. (2015) define inference tasks as "*those that provide insights*" (p. 720), which captures the essence of inference capability as the ability to derive

meaningful conclusions from accounting data. Analysing the literature through a consolidated lens reveals that MAPs' inference capability has evolved significantly with technological advancement. Traditional inferential processes relied on structured financial data and standardised analysis techniques, while modern capabilities leverage diverse data sources, advanced statistical methods, and visualisation tools to generate deeper insights. As Möller et al. (2020) emphasise, effective inference requires management accountants to synthesise evidence, management accounting knowledge, and contextual understanding, with data variety and volume serving as critical enablers.

A significant case study by Nespeca and Chiucchi (2018) examined ten BI&A consultants who managed over 300 projects in the Italian market and identified four primary motivations for implementing BI&A in MAPs, which are enhanced information timeliness, improved reliability, better information gathering and analysis, and strengthened cost-accounting practices. Their research revealed that BI&A implementation has led to significant changes in management accounting techniques, enabling greater reporting flexibility and customised analysis dimensions. However, most of their focus was on reporting and data processing aspects rather than predictive and prescriptive analytics capabilities. Building on this foundation, Spraakman et al. (2020) investigated the support that data analytics provides for predictions and assurance in MAPs through interviews across different industries. Their findings demonstrate that data analytics enhances management accounting tasks through multiple mechanisms, including simplified analytical processes, customised financial statement analysis, and self-serve analytics capabilities. As noted by Tiron-Tudor and Deliu (2021), these capabilities facilitate in-depth comparisons and detailed analysis of various accounts. The self-service analytics aspect, supported by Chen and Lin (2021) and Dahal et al. (2024), increases the accessibility of inference, prediction, and assurance tasks for analysts.

Recent studies have highlighted that BI&A solutions provide extensive measurement and analysis capabilities applicable across accounting activities (Mehdi et al. 2022). The focus of managerial accounting on financial planning, monitoring, control, and performance measurement aligns particularly well with BI&A's analytical capabilities (Elbashir et al. 2021). Modern BI&A solutions incorporate pre-designed scorecards and key performance indicators that enhance decision support capabilities (Peters et al. 2016). The mediating role of MAPs in organisational performance has been established in previous research. Uyar (2016) demonstrated that MAPs serve as a mediator between cost systems and corporate performance, highlighting the translation of technical capabilities into business outcomes through MAPs. For this mediation to occur, BI&A must enhance MAPs' inference capability, which in turn influences performance, a chain of relationships supported by multiple studies across multiple settings (Dahal et al. 2024; Rautiainen et al. 2024).

Recent work by Franke and Hiebl (2023) provides compelling evidence for this mediating relationship, documenting that BI&A investments provide management accountants with enhanced access to data, visual analytics, modelling tools, and automated insights. These technological capabilities improve various MAPs, including budgeting, cost analysis, forecasting, and performance measurement (Bhimani & Willcocks 2014). For example, increased access to customer data enables more accurate sales forecasting and budget projections, which ultimately support better resource allocation decisions. The mediating role of MAPs' inference capability can be further understood through examination of organisational learning theory and knowledge management perspectives. As Chapman et al. (2021) argue, the ability to translate technical capabilities into organisational knowledge requires effective mediating mechanisms. MAPs serve this role by providing structured approaches to analysing and interpreting data-driven insights. Similarly, Liang et al. (2023) demonstrate that the efficiency of business analytics implementations relies heavily on the organisation's ability to embed analytical capabilities within existing management control systems.

A deeper analysis of this mediating relationship reveals important distinctions. Goretzki and Pfister (2022) emphasise that while BI&A provides powerful analytical tools, the professional judgment and business knowledge of management accountants remain essential for effective decision support (Goretzki & Pfister 2023). This suggests that MAPs' inference capability acts as a crucial bridge between technological capabilities and organisational performance by combining automated analysis with professional expertise. Studies have also highlighted potential challenges in this mediating relationship. For instance, Mahlendorf et al. (2023) caution that organisations must carefully balance automation and human judgment when developing inference capabilities. Excessive reliance on automated analytics without adequate management accounting interpretation may lead to missed insights or misguided decisions. Conversely, failure to fully leverage BI&A capabilities through MAPs may result in suboptimal use of available data and analytics tools.

Drawing on this theoretical grounding and prior empirical findings, we posit that the inferential capability of MAPs serves as a mediator linking BI&A utilisation to organisational performance. This is depicted in Figure 1, which demonstrates the projected model of the relationship between BI&A, MAPs, and performance. This hypothesis addresses a significant gap in current understanding by examining the specific mechanisms through which BI&A investments are converted into performance improvements. By positioning MAPs' inference capability as a mediating factor, we provide a more revealing explanation of performance differences among organisations with similar BI&A investments, which may be attributed to variations in their ability to derive meaningful insights from analytics through enhanced MAPs (Youssef & Mahama 2021).

Therefore, we hypothesise:

H<sub>3</sub> MAPs' inference capability mediates the relationship between BI&A and organisational performance.

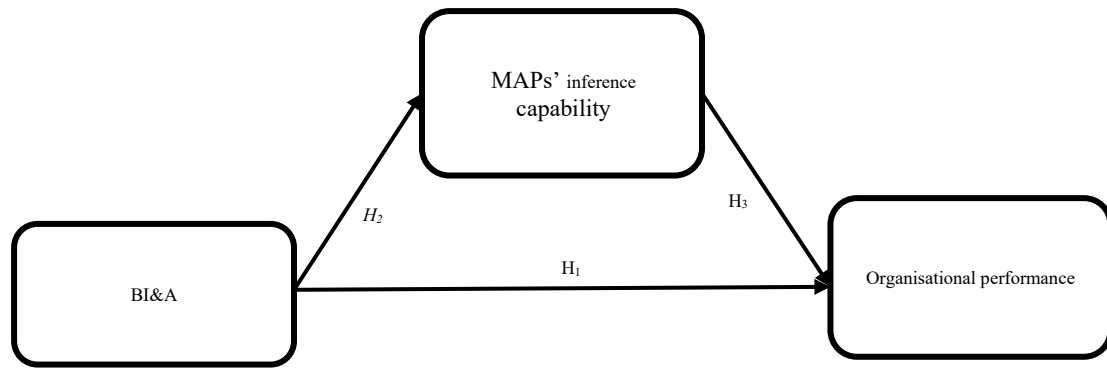


FIGURE 1. The model of the relationships between BI&A, MAPs, and performance.

## RESEARCH METHODOLOGY

Prior research exploring the intersection of BI&A and MAPs has utilised various methodologies, including cross-sectional surveys (Chen & Lin 2021; Steens et al. 2024; Youssef & Mahama 2021), qualitative case studies (Sprakman et al. 2020), and mixed methods approaches combining surveys with interviews (Fink et al. 2017). While qualitative case studies can offer deep insights into specific contexts, they often face limitations in terms of broader generalisability (Parker & Northcott 2016). The current study addresses this by employing a quantitative survey approach aimed at generating statistically generalisable findings (Arnold 2006), thus enabling an integrated understanding of BI&A's effects on MAPs' inference capability and the mediating role of the MAPs' inference capability.

## STUDY SAMPLE

The questionnaire items were derived from established studies in the literature, which included rigorous pre-tests conducted with academic scholars and industry experts. A Google Forms link was dispatched in March 2023 to a variety of financial professionals, including management accountants, chief financial officers (CFOs), financial analysts, and financial controllers, in 1,562 firms, including all 73 firms listed on the Abu Dhabi Exchange (ADX) and all 64 firms listed on the Dubai Financial Market (DFM). The survey was distributed using the professional network LinkedIn via the Sales Navigator service to access and filter companies. It contains contact information for a substantial proportion of medium and large enterprises operating in the UAE. This service allowed the researcher to filter companies based on their size using parameters such as the number of employees and turnover. It also allowed filtering of existing profiles based on specific functions, namely CFO, management accountants, financial controllers, financial analysts, and financial managers, which corresponded to the functions listed in the questionnaire.

The research followed the Central Bank of the UAE's identification of medium and large companies as those in different sectors that have more than 75 employees and achieve a turnover of over 10 million AED ( $\approx$  3.6 million USD) (Central Bank of the UAE 2021). A standardised message was sent to all 723 participants using the InMail service, and direct messages were sent after adding the participant to the researcher's network. Reminders were sent to the sample via email approximately two to four weeks after the first message for each participant category. The research population comprises organisations operating in the UAE. The research population includes companies in seven states (Abu Dhabi, Dubai, Sharjah, Ajman, Al Fujairah, Ras Al-Khaimah, and Um Al Quwain). The main justification for focusing on medium and large organisations is the limitations that small firms face in adopting BI&A because of a lack of technical knowledge, inadequate IT infrastructure, and cost constraints (Brands & Holtzblatt 2015; Uyar & Kuzey 2016). The collected data from the questionnaires were refined and coded. The researcher crafted easily understandable queries, shortened the questionnaires to mitigate potential fatigue among participants and provided unambiguous instructions to minimise misinterpretation of item content.

Survey questionnaires were distributed to 1,562 companies in the UAE during the five-month data collection period from March 2023 to July 2023. A total of 217 questionnaires were received; 192 were deemed complete and suitable for analysis, yielding a 14% response rate. We assessed potential non-response bias by comparing the mean scores of early ( $n = 36$ ) and late ( $n = 36$ ) respondents across all measurement indicators. Independent samples *t*-tests revealed no statistically significant mean differences for any indicator. These results suggest that non-response bias is unlikely to be a concern in this study.

Table 1 shows that the sample of 192 respondents effectively represents the UAE business landscape, with a balanced distribution across medium-sized (58.4%) and large organisations (41.7%). Industry representation reflects the UAE's

diverse economy, with key sectors such as consulting/professional services (18.8%), hospitality/tourism (13.5%), manufacturing (13.0%), and banking/finance (9.9%). Respondent profiles ensure subject matter expertise, comprising management accountants (35.4%), CFOs (26.0%), and financial controllers (18.8%)—professionals directly involved with BI&A and management accounting. Non-response bias testing comparing early and late respondents showed no significant differences, supporting sample representativeness and enhancing the generalisability of findings within the UAE context.

TABLE 1. Demographic profile

Variable	Level	Frequency	Percentage
Job title	Management accountant	68	35.4
	Financial controller	36	18.8
	Financial analyst	8	4.2
	CFO	50	26.0
	Manager	34	17.6
Industry type	Agricultural/mining/construction	4	2.1
	Banking/finance/insurance	19	9.9
	Consulting/professional service/IT	36	18.8
	Healthcare	4	2.1
	Hospitality/travel/tourism	26	13.5
	Manufacturing	25	13.0
	Oil and Gas	9	4.6
	Real Estate	10	5.2
	Retail/wholesale/distribution	34	17.7
	Telecommunications	8	4.2
	Transport/Logistics	17	8.9
	Agricultural/mining/construction	4	2.1
Number of employees	100-499	102	58.4
	500-1000	22	11.5
	> 1000	58	30.2
Annual turnover (AED)	10 million: 99 million	82	42.7
	100 million: 500 million	38	19.8
	> 500 million	72	37.5
	Total	192	

#### MEASUREMENT OF THE VARIABLES

The research constructs were measured according to the extant literature. BI&A was operationalised as the degree of implementation of, and reliance on, different components and techniques, building on measures developed in previous studies (Nespeca & Chiuicchi 2018; Yousef & Mahama 2021; Bergmann et al. 2020; Appelbaum et al. 2017). The measurement encompassed both technological and analytical dimensions. The technological components included Online Analytical Processing (OLAP), data mining capabilities, digital dashboarding systems, and data warehouse infrastructure. The analytical components span the full spectrum of analytics maturity: descriptive analytics focuses on comprehending historical patterns, diagnostic analytics focuses on conducting root cause analysis, predictive analytics forecasts future trends, and prescriptive analytics supports decision optimisation.

The inference capability of MAPs was assessed through the ability to derive real-time conclusions and insights from various MAPs and tasks (Uyar & Kuzey 2016). This construct was measured across four key dimensions. The first dimension, cost determination and financial control, evaluated budgeting practices, forecasting capabilities, and performance evaluation based on financial metrics. The second dimension focused on management planning and control, incorporating non-financial performance metrics, cost-volume-profit analysis, product profitability analysis, and investment evaluation using discounted cash flows. The third dimension addressed waste reduction in business resources through activity-based costing and quality cost reporting. The fourth dimension examined effective resource utilisation through advanced practices, including target costing, customer profitability analysis, industry structure analysis, value chain evaluation, and product life cycle assessment.

Organisational performance was measured using a balanced scorecard approach based on four perspectives (Bronzo et al. 2013). The financial perspective assessed profitability, revenue growth over the past two years, and cost reduction initiatives. The customer/market perspective evaluated customer loyalty and market share metrics. The learning and growth perspective measured workforce commitment to process performance goals and organisational capacity development. Finally, the internal process perspective assessed operational efficiency through metrics such as consistency in adhering to promised delivery dates.

For each construct, respondents rated their organisation's implementation or performance on a five-point Likert scale ranging from 1 (very low) to 5 (very high). The multi-dimensional measurement approach for each construct helps capture the complexity of modern business operations while maintaining construct validity through established scales. This comprehensive measurement framework enables examination of both direct relationships between variables and potential mediating effects. The following section presents the empirical results obtained through Partial Least Squares Structural Equation Modelling (PLS-SEM), validating the proposed hypotheses and offering insights into the mediating role of MAPs' inference capability.

## RESULTS AND DISCUSSION

### RELIABILITY AND VALIDITY

This study employs PLS-SEM using SmartPLS 4 to evaluate measurement reliability and construct validity. PLS-SEM was employed for its suitability in mediation analysis and prediction-oriented research involving complex capability relationships, as well as its ability to accommodate smaller sample sizes while maintaining statistical power (Hair et al. 2024). Mediation was assessed using bootstrapped indirect effects with confidence intervals, enabling a robust evaluation without reliance on distributional assumptions. While theoretical parsimony guided model specification, future studies may incorporate additional controls to examine heterogeneity and endogeneity effects (Steens et al. 2024). Individual indicator reliability was evaluated through standardised factor loadings. Measurement model validity was then assessed by examining convergent and discriminant validity, as demonstrated in Tables 2 and 3, respectively. Convergent validity refers to the consistency or substantial variance of multiple measures or indicators of a construct. Good convergent validity is achieved when these measures are highly correlated and measure the same concept (Fornell & Larcker 1981; Hair Jr et al. 2021). Four metrics are assessed: outer loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). The recommended range for all measures was established as follows: the AVE should surpass the established threshold of 0.50, the CR should ideally exceed 0.70, and the outer loadings (indicator reliability) for the measurement items should be higher than 0.70 (Fornell & Larcker 1981; Hair et al. 2021). The results indicate that each construct explained more than half of the variance in its indicators, and that internal consistency and reliability were satisfactory. Outer loadings that ranged from 0.40 to 0.70 were considered justifiable.

TABLE 2. Convergent validity results

Construct	Outer loadings	Cronbach's alpha	CR	AVE
BI&A	0.75225	0.913	0.914	0.567
MAPs Inference Capability	0.7345	0.949	0.957	0.562
Performance	0.799188	0.967	0.969	0.646

Discriminant validity refers to the empirical separability of a construct from conceptually related constructs. A common diagnostic criterion is the cross-loading, whereby an indicator's loading on its designated construct should exceed its loadings on other constructs. Table 3 reports the cross-loadings, with the largest loading for each indicator emphasised in bold to facilitate interpretation. Fornell and Larcker's (1981) criterion is also used to evaluate discriminant validity, requiring a construct's variance with its indicators to surpass the highest squared correlation with any other construct. Cross-loadings of indicators can also be used to assess discriminant validity. The study calculated the Heterotrait-Monotrait (HTMT) ratio of correlations to evaluate discriminant validity between the study variables. The HTMT values fall below the 0.85 threshold recommended by Hair et al. (2021), indicating satisfactory discriminant validity. The highest HTMT ratio of 0.686 is observed between BI&A and inference capability, followed by 0.669 between inference capability and performance, and 0.565 between BI&A and performance. These results demonstrate clear distinction between the constructs, confirming that each construct measures a unique concept and that the three constructs are empirically distinct.

TABLE 3. Cross-loadings: Discriminant validity assessment

Measures	BI&A	Inference	Performance
BI&A1	0.74	0.47	0.52
BI&A2	0.73	0.50	0.44
BI&A3	0.71	0.47	0.36
BI&A4	0.77	0.48	0.43
BI&A5	0.84	0.62	0.46
BI&A6	0.71	0.43	0.43
BI&A7	0.76	0.62	0.43
BI&A8	0.76	0.64	0.37
INF_MAP1	0.58	0.86	0.61
INF_MAP2	0.66	0.72	0.54
INF_MAP3	0.46	0.70	0.27
INF_MAP4	0.56	0.76	0.50
PERFORMANCE_1	0.41	0.53	0.73
PERFORMANCE_2	0.43	0.56	0.79
PERFORMANCE_3	0.44	0.57	0.81
PERFORMANCE_4	0.55	0.48	0.84

### STRUCTURAL MODEL

The SEM process involves a detailed analysis of relationships among various constructs, facilitated by the structural model. As outlined by Hair et al. (2014), this model leverages sample data to estimate parameters and predict the behaviour of

endogenous constructs. Path analysis, a subset of SEM, can be understood as a specialised form of linear regression tailored to assess the causal relationships between variables. SEM was incorporated to assess research hypotheses. The model examines the impact of BI&A on MAPs' inference capability and the mediating role of MAPs' inference capabilities in the relationship between the utilisation of BI&A and organisational performance. The absence of a standardised goodness-of-fit metric in PLS-SEM necessitates assessing model quality through the predictive capabilities of the endogenous constructs.

#### DIRECT RELATIONSHIPS

A bootstrapping approach was applied to the first model to examine the hypotheses proposed in this study. The process of bootstrapping involves using random resampling techniques on the initial dataset to generate new samples of equal size to the original dataset. This approach not only assesses the robustness of the dataset but also tests the statistical significance of the estimated coefficients and, in turn, the precision (i.e., margin of error) associated with the computed path estimates (Hair et al. 2014).

The results of the bootstrapping method are shown in Table 4 and illustrated in Figure 2, which presents the *p*-values for each path and path coefficient. The results showed that the effect of BI&A on MAPs' inference capabilities was statistically significant ( $\beta = 0.701$ ,  $t = 20.450$ ,  $p < 0.001$ ), while the effect of BI&A on performance was negative and significant ( $\beta = -0.267$ ,  $t = 2.409$ ,  $p < 0.001$ ).

TABLE 4. Relative path results and hypotheses

Path	$\beta$	<i>t</i> -value	<i>p</i> -value
BI&A → MAPs inference capabilities	0.704	20.391	<0.001
BI&A → OP	-0.277	2.456	<0.001
MAPs' inference capabilities → OP	0.361	4.746	<0.001

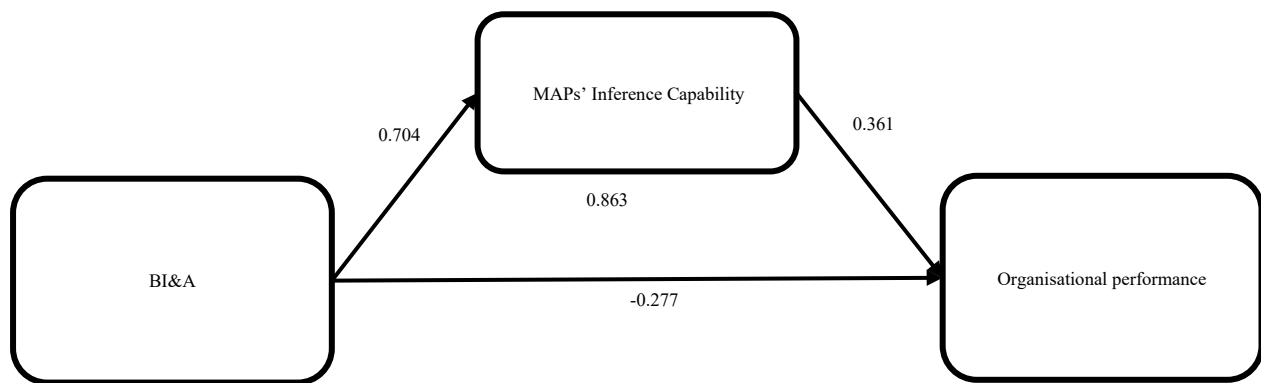


FIGURE 2. Path model

#### MEDIATION ANALYSIS

Mediation was assessed by estimating the indirect effect of BI&A utilisation on organisational performance through MAPs' inferential capability, conceptualised as an organisational capability. Table 5 reveals a significant indirect effect of BI&A on organisational performance through MAPs' inference capability ( $\beta = 0.842$ ,  $t = 9.356$ ,  $p < 0.001$ ). The total effect of BI&A on organisational performance was significant with the inclusion of the mediator, while the results demonstrate that BI&A adoption has a significant negative relationship with organisational performance ( $\beta = -0.277$ ,  $t = 2.456$ ,  $p < 0.001$ ).

TABLE 5. Mediation analysis

	Total effects			Direct effects			Indirect effects			
	$\beta$	<i>t</i> -value	<i>p</i> -value	$\beta$	<i>t</i> -value	<i>p</i> -value	$\beta$	SE	<i>t</i> -value	<i>p</i> -value
MAPs' inference capability → OP	0.565	9.532	0.000	-0.277	2.456	0.004	0.842	0.090	9.356	0.000

Note: SE = Standard Error

Results from Table 5 confirm that inference capability has a statistically significant indirect effect on organisational performance. Therefore, it may be asserted that, in this study, MAPs' inference capability has a mediating effect between BI&A and organisational performance.

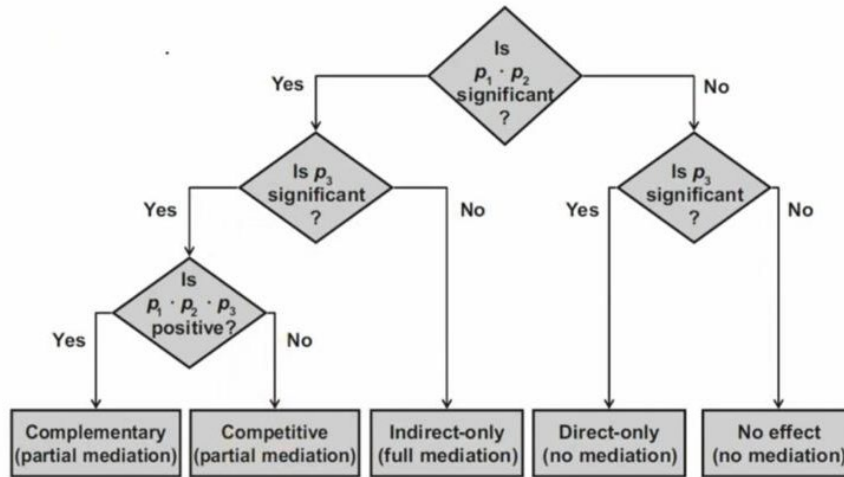


FIGURE 3. Mediation analysis procedure  
Source: Zhao et al. (2010)

According to Zhao et al.'s (2010) model, which is depicted in Figure 3,  $p_1$  and  $p_2$  represent the indirect effect of the mediator on the endogenous construct, and  $p_3$  represents the direct effect of the exogenous construct on the endogenous construct in the mediation model (BI&A  $\rightarrow$  OP). Since  $p_1$  and  $p_2$  are significant for MAPs' inference capability, while  $p_3$  is insignificant, it may be asserted that, in this study, MAPs' inference capability fully mediates the relationship between BI&A adoption and organisational performance.

TABLE 6. Hypotheses and relative paths

Hypothesis	Path	$\beta$	$p$ -value	Results
H <sub>1</sub> BI&A positively influences OP	BI&A $\rightarrow$ OP	-0.277	<0.001	Not supported
H <sub>2</sub> BI&A positively influences MAPs' inference capability	BI&A $\rightarrow$ MAPs inf. capabilities	0.704	<0.001	Supported
H <sub>3</sub> MAPs' inference capability mediates the relationship between BI&A and OP	BI&A $\rightarrow$ MAPs Inf. capabilities $\rightarrow$ OP	0.842	<0.001	Supported

The results confirm the hypothesised relationships, with MAPs' inference capability demonstrating a significant mediating effect. The discussion below contextualises these findings within the broader literature.

## DISCUSSION

The paper investigates the influence of BI&A on MAPs' inference capability and the mediating role of MAPs' inference capability between BI&A and organisational performance. Hypotheses were formulated to examine the relationships among factors expected to influence organisational performance. These associations were assessed within the proposed framework using survey responses from finance professionals and management accountants in organisations that utilise BI&A. The study used PLS-SEM to test these hypotheses.

H<sub>1</sub> BI&A positively influences OP.

BI&A adoption has a significant negative relationship with organisational performance ( $\beta = -0.277$ ). The results are partially consistent with the majority of the literature, for example, Aydiner et al. (2019) documented that the adoption of BI&A positively influences business process performance, and Shabbir and Gardezi (2020) reported a positive and significant influence of big-data analytics applications on corporate performance. Furthermore, other studies also reported positive associations between BI&A and performance outcomes (Appelbaum et al. 2017; Chen & Lin 2021; Mikalef et al. 2018; Peters et al. 2016). In addition, the influence of BI&A on organisational performance is subject to BI&A implementation and integration (Richards et al. 2019). However, the findings are inconsistent with some parts of the literature, such as Ramakrishnan et al. (2020), who identified a negative effect of BI&A integration on organisational effectiveness. The significant positive relationship between BI&A and MAPs' inferential capabilities ( $\beta = 0.704$ ) aligns with Peters et al.'s (2016) findings regarding BI&A's impact on performance measurement capabilities but extends this understanding by identifying specific inferential capabilities that are enhanced. Similarly, while Youssef and Mahama (2021) showed that BI&A partially mediates the relationship between enterprise resource planning (ERP) implementation and MAPs, our study reveals that MAPs' inferential capabilities fully mediate the association between BI&A and organisational performance. This difference may reflect the UAE's unique business environment, where organisations face pressure to rapidly adopt digital technologies without sufficient attention to developing complementary management accounting capabilities.

H<sub>2</sub> BI&A positively influences MAPs' inference capability.

This hypothesis was proposed to measure the influence of BI&A on MAPs' inference capability among organisations operating in the UAE. The findings show that organisations applying BI&A enhance MAPs' inference capability, with a  $\beta$  value of 0.704. Since MAPs' capabilities have not previously been assessed in this way in the literature, the result is interpreted in a broader context. Elbashir et al. (2021) reported that management-control-oriented BI&A enhances MAP-related control tools. This is also supported by Peters et al. (2016), who showed that BI&A quality, measured across three main dimensions (infrastructure, functionality, and self-services), influences performance measurement capabilities. Youssef and Mahama (2021) concluded that BI&A has an indirect impact on MAPs through ERP incorporation. Furthermore, Bergmann et al. (2020), Nawawi et al. (2020), Nespeca and Chiucchi (2018), and Pervan and Dropulić (2019) indicated that the utilisation of BI&A systems and the implementation of ERP systems result in substantial transformations in MAPs.

H<sub>3</sub> MAPs' inference capability mediates the relationship between BI&A and OP.

Our results showed that MAPs' capabilities fully mediate this relationship, implying that inference fully explains the relationship between BI&A and organisational performance. In other words, MAPs' capability clarifies the mechanisms and reasons through which BI&A influences organisational performance. These findings address the research question and are consistent with the hypothesis that MAPs' capabilities are important factors in explaining BI&A influence on organisational performance. Our findings are consistent with the literature, which suggests that MAPs are essential for effective BI&A use and value creation (Ahmed et al. 2019; Bordeleau et al. 2020; Möller et al. 2020; Raffoni et al. 2017). However, our study also reveals some differences in the mediating roles of MAPs' inference capability. While previous studies have emphasised the importance of MAPs for BI&A use, for example, Uyar and Kuzey (2016) reported that MAPs mediate the relationship between BI systems embedded in cost management systems and organisational performance, our study shows that strengthening MAPs' capabilities is critical for realising benefits from BI&A. The full mediation of inference capability highlights the need to develop and enhance MAPs to leverage BI&A improve organisational performance. This leads us to consider the different factors and enablers that enhance MAPs' capabilities and their outcomes. For example, adopting modern MAPs, such as activity-based costing, target costing, the balanced scorecard, total quality management, just-in-time, the theory of constraints, and process reengineering, is widely regarded as more appropriate for making informed decisions (Rashid et al. 2020).

The lack of a positive direct effect between BI&A utilisation and organisational performance aligns with recent evidence suggesting that analytics initiatives may initially disrupt established accounting routines or increase information complexity (Franke & Hiebl 2023; Mahlendorf et al. 2023). In such cases, BI&A investments alone are insufficient to generate performance improvements. From a management accounting perspective, performance gains emerge only when analytical outputs are transformed into decision-relevant knowledge through inference capability and professional judgment. Recent studies confirm that analytics technologies contribute to performance primarily through organisational capabilities rather than through direct technological effects (Steens et al. 2024). This supports the mediating role identified in this study.

#### COMPARISON WITH PRIOR RESEARCH

The study's results are broadly consistent with prior research while also contributing additional insights in several key respects. The negative and significant direct relationship between BI&A and organisational performance ( $\beta = -0.277$ ) contradicts some prior studies that reported positive direct relationships (Aydiner et al. 2019; Shabbir & Gardezi 2020). However, it aligns with Ramakrishnan et al.'s (2020) evidence of negative effects of BI&A integration on organisational effectiveness. This contradiction suggests that the relationship between BI&A and performance is more complex than previously understood, particularly in emerging economy contexts such as the UAE. The significant positive relationship between BI&A and MAPs' inferential capabilities ( $\beta = 0.704$ ) extends previous findings in important ways. While Elbashir et al. (2021) identified positive effects of BI&A on management control tools, and Peters et al. (2016) documented impacts on performance measurement capabilities, our study specifically isolates the inferential dimension of MAPs. This distinction is important because it highlights that BI&A's primary value lies not in automating existing accounting processes but in enhancing the capability to derive meaningful insights from accounting data.

The full mediation effect of MAPs' inferential capabilities represents the study's most significant contribution relative to prior research. Earlier work has largely focused on the direct link between BI&A and performance outcomes (Bordeleau et al. 2020) or on specific mediating factors such as process capabilities (Elbashir et al. 2013). Our finding that MAPs' inference capability fully mediates the BI&A-performance relationship extends Uyar and Kuzey's (2016) work, which showed that MAPs mediate the relationship between cost systems and performance. However, the present study's focus on inferential capabilities provides a more precise understanding of the specific mechanism underlying this mediation. In the UAE context, our findings provide novel insights that challenge some assumptions in the literature. While previous UAE-focused studies have emphasised technological factors in BI&A implementation (Farhan et al. 2017), our results highlight

the critical importance of organisational capabilities in translating technological investments into performance outcomes. This is particularly relevant given the UAE's substantial investments in digital transformation initiatives under Vision 2025.

## CONCLUSION

The study's findings reveal patterns that are particularly relevant to the UAE's business environment. The significant influence of BI&A on MAPs' inferential capabilities ( $\beta = 0.704$ ) aligns with the UAE's aggressive pursuit of digital transformation, especially in financial and accounting practices. This relationship is particularly noteworthy given the UAE's position as a regional financial hub and its recent initiatives to enhance data-driven decision-making across industries. The full mediation effect of MAPs' inferential capabilities between BI&A and organisational performance has specific implications for UAE businesses. Our findings suggest that UAE organisations should prioritise integrating their BI&A implementations with the UAE's Smart Government initiatives while leveraging government-supported digital infrastructure programmes. Furthermore, organisations should ensure their MAPs align with the UAE's sustainability reporting requirements, which have become increasingly stringent in recent years.

An important finding from our investigation is the mediating role of MAPs. This underscores the pivotal role of MAPs in translating BI&A analytical insights into actionable strategies to improve performance. This is reflected in the mediating role of MAPs' capabilities in both BI&A and performance. It aligns with the proposition by Oesterreich et al. (2019), Pervan and Dropulić (2019), Richards et al. (2019), Uyar and Kuzey (2016), Vallurupalli and Bose (2018), Appelbaum et al. (2017), and Youssef and Mahama (2021) that the strength of BI&A is truly harnessed when paired with effective management practices. Lastly, while MAPs' relationship with performance is found to be decidedly positive, this relationship is contingent on numerous factors, including the adaptability of organisations, the training provided to accountants, and the degree of synergy between BI&A tools and traditional accounting practices.

## THEORETICAL AND PRACTICAL CONTRIBUTIONS

This study offers significant theoretical contributions by expanding the RBV within the context of BI&A and management accounting. The finding that MAPs' inference capability fully mediates the relationship between BI&A and organisational performance reinforces RBV's central premise that competitive advantage arises from organisational capabilities rather than from technological resources alone. Specifically, the results demonstrate that BI&A generates value only when it is transformed through inferential capabilities embedded in management accounting processes. By identifying MAPs' inference capability as a critical mechanism linking analytics investments to performance outcomes, this study refines RBV by specifying the conversion of technological resources into value in knowledge-intensive accounting contexts. Moreover, the findings empirically substantiate RBV's notion of resource complementarity, showing that BI&A and accounting capabilities must be integrated—rather than deployed independently—to produce performance gains. The study further extends RBV's applicability to emerging-economy settings, suggesting that institutional contexts, such as those in the UAE, may shape interactions between resources and capabilities.

From a practical perspective, the results emphasise that organisations should prioritise the development of management accounting inference capabilities alongside BI&A implementation. Investments in analytics technologies without corresponding capability development are unlikely to yield performance improvements. For UAE organisations, this insight aligns with national digital transformation objectives while emphasising the importance of human capital and process development. For CFOs and senior finance leaders, the results underline the need to align BI&A initiatives with accounting capability building, while for management accountants, they underscore the growing strategic importance of analytical judgment and inferential skills in performance-oriented decision-making (Franke & Hiebl 2023; Steens et al. 2024).

## LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Although this study offers useful insights into the relationships between BI&A utilisation, MAPs' inferential capability, and organisational performance, several limitations warrant acknowledgement and provide directions for future research. First, the cross-sectional research design constrains causal inference; accordingly, the observed associations should not be interpreted as definitive evidence of causality. Future research could adopt longitudinal designs to examine the influence of BI&A implementations on the development of MAPs' inference capabilities over time. Additionally, while our sample size ( $n = 192$ ) is adequate for PLS-SEM analysis, larger samples would enhance statistical power and enable more sophisticated multi-group analyses to examine industry-specific effects. Our focus on medium and large organisations in the UAE may limit the generalisability of findings to other contexts. Future research could examine these relationships in different national settings, particularly comparing emerging and developed economies to identify institutional factors that influence the effectiveness of BI&A implementations. Additionally, our sample underrepresents small enterprises, which may face different challenges in developing inferential capabilities due to resource constraints. Studies specifically targeting smaller organisations would provide valuable complementary insights.

This study conceptualises BI&A as a composite capability that combines technological infrastructure and analytical functionality, consistent with recent accounting research (Arkhipova et al. 2024). While this approach supports concise

modelling, it abstracts from potential differences across analytics types and maturity levels. Prior research suggests that descriptive, predictive, and prescriptive analytics may have distinct implications for accounting practices and decision quality (Barreto et al. 2024). Future research may therefore disaggregate BI&A dimensions and examine contextual moderators such as analytics maturity and governance structures (Steens et al. 2024). A further limitation of this study concerns the absence of control variables that may influence organisational performance independently of BI&A-MAPs integration. Factors such as firm age, industry competitiveness, technological infrastructure, and prior financial performance may shape both analytics adoption and performance outcomes.

## REFERENCES

- Abdelhalim, A.M. 2024. How management accounting practices integrate with big data analytics and its impact on corporate sustainability. *Journal of Financial Reporting and Accounting* 22(2): 416–432.
- Adu-Gyamfi, J. & Chipwere, K.Y.W. 2020. The impact of management accounting practices on the performance of manufacturing firms: An empirical evidence from Ghana. *Research Journal of Finance and Accounting* 11(20): 100–113.
- Ahmed, A., Yusof, S.A.M. & Oroumchian, F. 2019. Understanding the business value creation process for business intelligence tools in the UAE. *Pacific Asia Journal of the Association for Information Systems* 11(3): 55-88.
- Aljumah, A.I., Nuseir, M.T. & El Refae, G.A. 2022. Business analytics and competitive advantage for SMEs in UAE: A mediating role of technology assets. *2022 International Arab Conference on Information Technology (ACIT)*: 1–9.
- Appelbaum, D., Kogan, A., Vasarhelyi, M. & Yan, Z. 2017. Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems* 25: 29–44.
- Arnold, V. 2006. Behavioral research opportunities: Understanding the impact of enterprise systems. *International Journal of Accounting Information Systems* 7(1): 7–17.
- Aydiner, A.S., Tatoglu, E., Bayraktar, E., Zaim, S. & Delen, D. 2019. Business analytics and firm performance: The mediating role of business process performance. *Journal of Business Research* 96(November 2018): 228–237.
- Awadallah, E. 2024. *Optimizing corporate performance through digital transformation: The role of management accountants in the GCC*. SSRN.
- Barreto, A., Gomes, P., Quesado, P. & O’Sullivan, S. 2025. Advancements in management accounting and digital technologies: A systematic literature review. *Accounting, Finance & Governance Review* 34(1): 1-47.
- Bergmann, M., Brück, C., Knauer, T. & Schwering, A. 2020. Digitization of the budgeting process: determinants of the use of business analytics and its effect on satisfaction with the budgeting process. *Journal of Management Control* 31(1): 25-54.
- Bhimani, A. 2020. Digital data and management accounting: Why we need to rethink research methods. *Journal of Management Control* 31(1–2): 9–23.
- Bordeleau, F.-E., Mosconi, E. & de Santa-Eulalia, L.A. 2020. Business intelligence and analytics value creation in Industry 4.0: a multiple case study in manufacturing medium enterprises. *Production Planning & Control* 31(2–3): 173–185.
- Brands, K. & Holtzblatt, M. 2015. Business analytics: Transforming the role of management accountants. *Management Accounting Quarterly* 16(3): 1-12.
- Bronzo, M., de Resende, P.T.V., de Oliveira, M.P.V., McCormack, K.P., de Sousa, P.R. & Ferreira, R.L. 2013. Improving performance aligning business analytics with process orientation. *International Journal of Information Management* 33(2): 300–307.
- Central Bank of the United Arab Emirates. 2021. *Small and medium-sized enterprises (SME) market conduct regulation*. Central Bank of the UAE Rulebook. <https://tinyurl.com/3smer872>
- Chen, Y. & Lin, Z. 2021. Business intelligence capabilities and firm performance: A study in China. *International Journal of Information Management* 57.
- Chong, V.K. & Eggleton, I.R.C. 2003. The decision-facilitating role of management accounting systems on managerial performance: The influence of locus of control and task uncertainty. *Advances in Accounting* 20: 165–197.
- Dahal, R.K., Ghimire, B., Gurung, R., Karki, D. & Joshi, S.P. 2024. Management accounting’s role in decision-making and efficacy. *Cogent Business & Management* 11(1): 1-20.
- Elbashir, M.Z., Collier, P.A. & Sutton, S.G. 2011. The role of organizational absorptive capacity in strategic use of business intelligence to support integrated management control systems. *The Accounting Review* 86(1): 155–184.
- Elbashir, M.Z., Collier, P.A., Sutton, S.G., Davern, M.J. & Leech, S.A. 2013. Enhancing the business value of business intelligence: The role of shared knowledge and assimilation. *Journal of Information Systems* 27(2): 87–105.
- Elbashir, M.Z., Sutton, S.G., Arnold, V. & Collier, P.A. 2021. Leveraging business intelligence systems to enhance management control and business process performance in the public sector. *Meditari Accountancy Research* 30(4): 914-940.
- Farhan, A., Obaid, S.N. & Azlan, H. 2017. Corporate governance effect on firms’ performance – evidence from the UAE. *Journal of Economic and Administrative Sciences* 33(1): 66–80.
- Fink, L., Yogev, N. & Even, A. 2017. Business intelligence and organizational learning: An empirical investigation of value creation processes. *Information & Management* 54(1): 38–56.

- Geddes, B.H. 2020. Emerging technologies in management accounting. *Journal of Economics and Business* 3(1): 152-159.
- George, A., Schmitz, K. & Storey, V.C. 2020. A framework for building mature business intelligence and analytics in organizations. *Journal of Database Management (JDM)* 31(3): 14–39.
- Gomez-Conde, J., Lunkes, R.J. & Rosa, F.S. 2019. Environmental innovation practices and operational performance: The joint effects of management accounting and control systems and environmental training. *Accounting, Auditing & Accountability Journal* 32(5): 1325-1357.
- Goretzki, L. & Pfister, J.A. 2023. The productive accountant as (un-) wanted self: Realizing the ambivalent role of productivity measures in accountants' identity work. *Critical Perspectives on Accounting* 95.
- Hair, J.F., Sarstedt, M., Hopkins, L. & Kuppelwieser, V.G. 2014. Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review* 26(2): 106–121.
- Kowalczyk, M. & Buxmann, P. 2015. An ambidextrous perspective on business intelligence and analytics support in decision processes: Insights from a multiple case study. *Decision Support Systems* 80: 1–13.
- Lee, J.H. & Park, S.C. 2005. Intelligent profitable customers segmentation system based on business intelligence tools. *Expert Systems with Applications* 29(1): 145–152.
- Mahlendorf, M.D., Martin, M.A. & Smith, D. 2023. Innovative data–use-cases in management accounting research and practice. *European Accounting Review* 32(3): 547–576.
- Marx, F., Wortmann, F. & Mayer, J.H. 2012. A maturity model for management control systems. *Business & Information Systems Engineering* 4(4): 193–207.
- Mehdi, A., Alaoui, O. & Zhor, L. 2022. The Impact of Business Intelligence systems on management accounting in companies: Literature review. *Revue Du Contrôle, de La Comptabilité et de l'audit* 6(1): 107–129.
- Mikalef, P., Pappas, I. O., Krogstie, J. & Giannakos, M. 2018. Big data analytics capabilities: A systematic literature review and research agenda. *Information Systems and E-Business Management* 16(3): 547–578.
- Möller, K., Schäffer, U. & Verbeeten, F. 2020. Digitalization in management accounting and control: An editorial. *Journal of Management Control* 31: 1-8.
- Möller, K., Schäffer, U., Verbeeten, F., ... Geddes, B.H. 2022. The illusion of data-driven decision making – The mediating effect of digital orientation and controllers' added value in explaining organizational implications of advanced analytics. *International Journal of Accounting Information Systems* 24(1): 1–17.
- Nawawi, M., Mulyadi, R. & Yunia, D. 2020. Controlling the changing management accounting practices in the enterprise resources planning environment. *Jurnal Manajemen dan Bisnis Controlling the Changing of Management Accounting Practices* 9(2): 119–132.
- Oesterreich, T.D., Teuteberg, F., Bensberg, F. & Buscher, G. 2019. The controlling profession in the digital age: Understanding the impact of digitisation on the controller's job roles, skills and competences. *International Journal of Accounting Information Systems* 35(C).
- Parker, L.D. & Northcott, D. 2016. Qualitative generalising in accounting research: concepts and strategies. *Accounting, Auditing & Accountability Journal* 29(6): 1100–1131.
- Pavlatos, O. & Kostakis, H. 2015. Management accounting practices before and during economic crisis: Evidence from Greece. *Advances in Accounting* 31(1): 150–164.
- Pervan, I. & Dropulić, I. 2019. The impact of integrated information systems on management accounting: Case of Croatia. *Management (Croatia)* 24(1): 21–38.
- Peteraf, M.A. & Barney, J.B. 2003. Unraveling the resource-based tangle. *Managerial and Decision Economics* 24(4): 309–323.
- Peters, M.D., Wieder, B., Sutton, S.G. & Wakefield, J. 2016. Business intelligence systems use in performance measurement capabilities: Implications for enhanced competitive advantage. *International Journal of Accounting Information Systems* 21: 1–17.
- Petrini, M. & Pozzebon, M. 2009. Managing sustainability with the support of business intelligence: Integrating socio-environmental indicators and organisational context. *The Journal of Strategic Information Systems* 18(4): 178–191.
- Pickard, M.D. & Cokins, G. 2015. From bean counters to bean growers: Accountants as data analysts—a customer profitability example. *Journal of Information Systems* 29(3): 151–164.
- Raffoni, A., Visani, F., Bartolini, M. & Silvi, R. 2017. The management of operations business performance analytics: Exploring the potential for performance management systems. *Production Planning & Control* 29(1): 51-67.
- Ramakrishnan, T., Khuntia, J., Kathuria, A. & Saldanha, T.J.V. 2020. An integrated model of business intelligence & analytics capabilities and organizational performance. *Communications of the Association for Information Systems* 46(1): 722-750.
- Rashid, M.M., Ali, M.M. & Hossain, D.M. 2020. Strategic management accounting practices: A literature review and opportunity for future research. *Asian Journal of Accounting Research* 6(1): 109–132.
- Rautiainen, A., Scapens, R.W., Järvenpää, M., Auvinen, T. & Sajasalo, P. 2024. Towards fluid role identity of management accountants: A case study of a Finnish bank. *The British Accounting Review* 56: 1-15.
- Richards, G., Yeoh, W., Chong, A.Y.L. & Popovič, A. 2019. Business intelligence effectiveness and corporate performance management: An empirical analysis. *Journal of Computer Information Systems* 59(2): 188–196.

- Rikhardsson, P. & Yigitbasioglu, O. 2018. Business intelligence & analytics in management accounting research: Status and future focus. *International Journal of Accounting Information Systems* 29: 37–58.
- Schneider, G.P., Dai, J., Janvrin, D.J., Ajayi, K. & Raschke, R.L. 2015. Infer, predict, and assure: Accounting opportunities in data analytics. *Accounting Horizons* 29(3): 719–742.
- Shabbir, M.Q. & Gardezi, S.B.W. 2020. Application of big data analytics and organizational performance: The mediating role of knowledge management practices. *Journal of Big Data* 7(1): 1–17.
- Spraakman, G., Sanchez-Rodriguez, C. & Tuck-Riggs, C.A. 2020. Data analytics by management accountants. *Qualitative Research in Accounting & Management* 18(1): 127-147.
- Steens, B., Bots, J. & Derks, K. 2024. Developing digital competencies of controllers: Evidence from the Netherlands. *International Journal of Accounting Information Systems* 52.
- Uyar, A. & Kuzey, C. 2016. Does management accounting mediate the relationship between cost system design and performance? *Advances in Accounting* 35: 170–176.
- Vallurupalli, V. & Bose, I. 2018. Business intelligence for performance measurement: A case based analysis. *Decision Support Systems* 111(2017): 72–85.
- Youssef, M. & Mahama, H. 2021. Does business intelligence mediate the relationship between ERP and management accounting practices? *Journal of Accounting and Organizational Change* 17(5): 686–703.
- Zhao, X., Lynch Jr, J.G. & Chen, Q. 2010. Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research* 37(2): 197–206.
- Zóltowski, D. 2022. Business intelligence in balanced scorecard: Bibliometric analysis. *Procedia Computer Science* 207: 4075–4086.

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