Digitalization in Strategic Management Accounting: The Role of Strategic Control Systems, Performance Measurement, and Decision-Making

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ABSTRACT

This study aims to examine the role of digitalization in strengthening strategic management accounting practices, particularly in the areas of management control systems, performance measurement, and strategic decision-making. The increasing adoption of digital technologies such as big data analytics, artificial intelligence, enterprise resource planning (ERP), and cloud computing has significantly transformed how organizations generate, process, and utilize accounting information. This study employs a Systematic Literature Review (SLR) approach to synthesize findings from 21 peer-reviewed journal articles and one academic book published within the last ten years. The review process involves systematic identification, screening, data extraction, and thematic analysis to ensure a comprehensive and reliable synthesis of existing research. The findings indicate that digitalization enhances the effectiveness of management control systems by improving data integration, real-time monitoring, and coordination across organizational units. In terms of performance measurement, digital technologies contribute to higher accuracy, relevance, and timeliness of performance information, enabling organizations to evaluate outcomes more comprehensively. Furthermore, digitalization strengthens strategic decision-making processes by providing data-driven insights, reducing uncertainty, and supporting proactive managerial actions. However, the study also identifies several challenges, including limitations in digital competencies, system integration issues, and resistance to organizational change, which may hinder the optimal implementation of digital technologies. This study contributes to the strategic management accounting literature by providing an integrated perspective on the impact of digitalization across key organizational functions. Practically, the findings offer insights for managers and policymakers in designing effective digital transformation strategies that align with organizational goals. The study concludes that digitalization serves as a strategic enabler that not only improves operational efficiency but also enhances the overall quality of managerial decision-making in dynamic business environments.

INTRODUCTION

The advancement of digital technology has fundamentally transformed the practice of strategic management accounting across various sectors. The integration of technologies such as business intelligence, big data analytics, cloud computing, enterprise resource planning (ERP), and artificial intelligence (AI) increasingly influences how organizations generate information, control activities, measure performance, and make strategic decisions. This transformation requires management accounting to move beyond a historical reporting focus and instead provide forward-looking information that is relevant for managers operating in dynamic and uncertain business environments (Appelbaum et al., 2017). In this context,

Pierotti et al. (2024) emphasize that the transition toward modern data ecosystems positions information as a critical asset that significantly enhances managerial monitoring and decision-making effectiveness. This perspective reinforces that digitalization is not merely a technological innovation but a foundational shift in how organizations manage and transform information into strategic actions.

As competition intensifies and market uncertainty increases, organizations require more responsive and data-driven strategic control systems. Management Control Systems (MCS) play a crucial role in ensuring that organizational strategies are effectively aligned with their implementation. Prior studies indicate that the quality of technology-based information systems significantly affects the effectiveness of MCS, particularly in terms of diagnostic and interactive controls, which enable managers to identify deviations, evaluate performance, and design corrective actions in a timely manner (Peters et al., 2016). In this regard, digitalization not only enhances operational efficiency but also shifts the paradigm of management control toward a more analytical and strategically oriented approach grounded in data.

Digital technologies have also significantly reshaped organizational performance measurement practices. The availability of real-time data, more diverse performance indicators, and predictive analytics capabilities enables organizations to anticipate changes before they escalate. Nguyen et al. (2022) demonstrate that digitally enabled performance measurement systems improve both the accuracy and timeliness of reporting, allowing strategic decisions to be based on more relevant and integrated information. This finding is consistent with Putri (2025), who argues that digitalization strengthens information quality at strategic, operational, and tactical levels. Furthermore, Pierotti et al. (2024) show that the integration of AI, analytics, and accounting information systems establishes a new framework for performance measurement, where data are analyzed more deeply to generate strategic insights that support decision-making processes.

Despite the growing evidence of the benefits of digitalization in strategic management accounting, the literature suggests that not all organizations are able to implement these technologies effectively. Some organizations face constraints related to digital competencies of human resources, organizational readiness, system integration, and resistance to change (Bhaktiningsih & Surbakti, 2024). These challenges create a gap between technological potential and actual implementation, resulting in varying levels of effectiveness in strategic control systems across organizations. Moreover, prior research has not comprehensively integrated the simultaneous impact of digitalization on strategic control systems, performance measurement, and decision-making, even though these three dimensions are interrelated and jointly influence strategic effectiveness.

In addition to internal organizational factors, external environmental dynamics also play a critical role in shaping the success of digital transformation. Rapid technological advancements, evolving regulatory frameworks, and increasing global competition compel organizations to continuously adapt and innovate. Organizations that successfully align digital technologies with their business strategies are more likely to achieve sustainable competitive advantages. Therefore, digitalization should not be viewed solely as an operational necessity but as an integral component of long-term strategic positioning.

Furthermore, human capital emerges as a key determinant in the success of digital

transformation initiatives. Management accountants are increasingly expected to possess analytical capabilities, technological literacy, and the ability to interpret complex data. This shift transforms their role from traditional information providers into strategic partners in decision-making processes. Consequently, continuous investment in training and professional development is essential to ensure that organizations can fully leverage the benefits of digital technologies.

On the other hand, the integration of digital systems also introduces new challenges related to data security, privacy, and information reliability. The risks of data breaches, cyberattacks, and system vulnerabilities necessitate robust governance mechanisms and internal controls. Organizations must therefore balance the benefits of digitalization with the need to ensure data integrity and security. Effective governance frameworks and risk management practices become increasingly important to maintain stakeholder trust and support sustainable digital transformation.

Based on this background, this study aims to explore the role of digitalization in strengthening strategic control systems, enhancing the quality of performance measurement, and supporting strategic decision-making. The research problem arises from the condition in which the rapid advancement of digital technology is not always matched by the organization's ability to utilize it effectively. This study further investigates how digital technologies influence the design and effectiveness of strategic control systems, the extent to which digitalization improves the accuracy and relevance of performance measurement, and how it enhances data-driven decision-making processes within organizations.

This study contributes theoretically to the development of strategic management accounting literature by providing a comprehensive explanation of the impact of digital technologies on these three core dimensions. Practically, the findings are expected to assist managers and management accountants in designing effective digitalization strategies. In addition, this study offers implications for policymakers in strengthening organizational digital capabilities to remain adaptive in the face of rapid change and data-driven competition in the modern era.

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LITERATURE REVIEW

Strategic Management Accounting in the Digital Era

Strategic management accounting (SMA) has evolved significantly with the rapid integration of digital technologies into organizational processes. Traditionally, SMA focused on cost control and financial reporting; however, in the digital era, its role has expanded toward strategic planning, performance evaluation, and decision support. Digital transformation has enabled organizations to process large volumes of structured and unstructured data, thereby enhancing the relevance and timeliness of accounting information (Appelbaum et al., 2017; Pierotti et al., 2024). This evolution reflects a paradigm shift in which accounting information is no longer retrospective but increasingly forward-looking and predictive. As a result, SMA has become a critical component in enabling organizations to navigate complex and uncertain business environments.

The integration of digital technologies such as cloud computing and enterprise systems has strengthened the analytical capacity of SMA. Studies by Nadiar et al. (2025) and Mevelia et al. (2025) indicate that real-time data processing and system integration significantly improve the responsiveness of management accounting practices. These technologies allow organizations to generate more accurate forecasts and support dynamic strategic adjustments. Furthermore, Heliani (2019) emphasizes that despite technological advancements, the effectiveness of SMA still depends on the quality of managerial practices and organizational structures. Therefore, digital tools must be complemented by strong governance and leadership to achieve optimal outcomes.

Moreover, the emergence of big data and artificial intelligence has further enhanced the scope of SMA. These technologies facilitate deeper data analysis, enabling organizations to identify patterns and trends that were previously undetectable (Shi, 2021; Qazi & Sher, 2016). The integration of predictive analytics into SMA practices allows managers to anticipate risks and opportunities more effectively. In this context, SMA acts as a bridge between data analytics and strategic decision-making. Consequently, organizations that leverage advanced analytical tools are better positioned to achieve sustainable competitive advantages.

Despite these advancements, challenges remain in implementing digital SMA practices. Organizational resistance, lack of digital competencies, and integration issues often hinder the adoption of advanced technologies (Bhaktiningsih & Surbakti, 2024; Nugraha et al., 2024). Additionally, the complexity of digital systems requires significant investment in infrastructure and human capital. These challenges highlight the need for a holistic approach to digital transformation that encompasses technological, organizational, and human factors. Therefore, future research should explore strategies to overcome these barriers and maximize the benefits of digital SMA.

Digitalization and Management Control Systems

Management Control Systems (MCS) play a fundamental role in aligning organizational strategies with operational execution. In the digital era, MCS has undergone significant transformation through the integration of advanced information systems. Digital technologies enhance the ability of organizations to monitor performance, detect deviations, and implement corrective actions in real time (Peters et al., 2016; Elbashir, 2021). This transformation has shifted MCS from a reactive mechanism to a proactive and adaptive system. As a result, organizations can respond more effectively to dynamic market conditions.

The integration of enterprise resource planning (ERP) systems has significantly improved the effectiveness of MCS. Yustian (2025) demonstrates that ERP systems enhance data consistency, reporting speed, and operational efficiency. These systems enable organizations to integrate financial and non-financial data, thereby supporting comprehensive performance evaluation. Furthermore, Piliang (2025) highlights that digital systems facilitate coordination across organizational units. This integration strengthens internal control mechanisms and improves strategic alignment.

Artificial intelligence also plays a crucial role in enhancing MCS capabilities. AI

technologies enable automated monitoring, anomaly detection, and predictive analysis (Pierotti et al., 2024). These capabilities allow organizations to identify potential risks and inefficiencies more accurately. Additionally, AI supports the development of adaptive control systems that can adjust to changing business environments. This advancement represents a significant shift toward data-driven management control practices.

However, the effectiveness of digital MCS depends on organizational readiness and technological integration. Sandanafu et al. (2017) emphasize that information technology acts as a moderating factor in the relationship between MCS and organizational performance. Organizations that successfully integrate digital tools into their control systems are more likely to achieve higher performance outcomes. Conversely, inadequate implementation may lead to inefficiencies and misalignment. Therefore, organizations must ensure that digital MCS is supported by appropriate infrastructure and competencies.

Digitalization and Performance Measurement

Performance measurement has become increasingly sophisticated with the adoption of digital technologies. Traditional performance measurement systems were often limited to financial indicators, whereas modern systems incorporate both financial and non-financial metrics. Digital tools enable organizations to collect and analyze data in real time, thereby improving the accuracy and relevance of performance evaluation (Saputra et al., 2023; Nguyen et al., 2022). This shift allows organizations to monitor performance continuously and respond to changes more effectively.

The use of big data analytics has significantly enhanced the predictive capabilities of performance measurement systems. Studies by Shi (2021) and Peters et al. (2016) highlight the role of data analytics in identifying trends and forecasting future performance. These capabilities enable organizations to anticipate potential challenges and opportunities. Furthermore, Qazi and Sher (2016) demonstrate that predictive models improve decision-making accuracy by providing data-driven insights. As a result, performance measurement systems have become more strategic and forward-looking.

Digitalization also facilitates the integration of multidimensional performance indicators. Pierotti et al. (2024) argue that machine learning and advanced analytics enable organizations to develop more precise and comprehensive performance metrics. These technologies allow managers to analyze complex relationships between different performance variables. Additionally, Matsuoka (2020) emphasizes the role of automated financial systems in improving real-time performance evaluation. This integration enhances the overall effectiveness of performance management processes.

Despite these benefits, challenges related to data quality and system integration remain significant. Organizations must ensure that data used in performance measurement is accurate, reliable, and consistent. Moreover, the complexity of digital systems requires robust data governance frameworks. Without proper management, digitalization may lead to information overload and reduced decision-making efficiency. Therefore, organizations must adopt a balanced approach to digital performance measurement.

Digitalization and Strategic Decision-Making

Strategic decision-making has been fundamentally transformed by digital technologies. The availability of real-time and integrated data enables organizations to make faster and more informed decisions. Mevelia et al. (2025) demonstrate that digital systems improve decision-making quality across strategic, tactical, and operational levels. These systems reduce information asymmetry and enhance coordination among decision-makers. Consequently, organizations can respond more effectively to environmental changes.

The role of management accounting in decision-making has also evolved significantly. Putri (2025) emphasizes that high-quality accounting information is essential for effective strategic decisions. Digital tools enhance the relevance and timeliness of this information, thereby supporting better evaluation of strategic alternatives. Furthermore, Nguyen et al. (2022) highlight that integrated systems improve data accessibility and consistency. This integration strengthens the overall decision-making process within organizations.

Artificial intelligence further enhances decision-making capabilities by enabling predictive and prescriptive analytics. Pierotti et al. (2024) argue that AI shifts decision-making from reactive to proactive approaches. These technologies provide deeper insights and reduce uncertainty in strategic planning. Additionally, Appelbaum et al. (2017) highlight the role of analytics in improving evidence-based decision-making. As a result, organizations can achieve more effective and efficient strategic outcomes.

However, the adoption of digital decision-making tools is not without challenges. Bhaktiningsih and Surbakti (2024) identify issues related to technological readiness and organizational resistance. Ghofar et al. (2025) also note that the effectiveness of digital decision-making depends on organizational characteristics. These findings suggest that successful implementation requires alignment between technology and organizational capabilities. Therefore, organizations must invest in both technology and human capital.

METHODS

This study employs a Systematic Literature Review (SLR) approach to provide a comprehensive and structured analysis of the role of digitalization in strategic management accounting. The SLR method is widely recognized in academic research for its rigor, transparency, and ability to synthesize findings from multiple studies (Tranfield et al., 2003). This approach ensures that the review process is systematic, replicable, and free from selection bias. The primary objective of this method is to identify, evaluate, and integrate existing research findings to generate a holistic understanding of the research topic.

The research process consists of several stages, including problem identification, literature search, screening, data extraction, and synthesis. The literature search was conducted using major academic databases such as Scopus, Google Scholar, and SINTA. Keywords used in the search process include “digitalization,” “strategic management accounting,” “management control systems,” “performance measurement,” and “decision-making.” Inclusion criteria were applied to ensure the relevance and quality of selected articles, including publication within the last ten years and empirical or systematic research focus.

A total of 21 peer-reviewed journal articles and one academic book were selected for analysis. The screening process involved evaluating titles, abstracts, and full texts to ensure alignment with the research objectives. Data extraction was conducted systematically to capture key information such as research context, methodology, and findings. This process ensures consistency and accuracy in the analysis.

The data were analyzed using a thematic approach, categorizing findings into key themes related to digitalization and strategic management accounting. This approach allows for the identification of patterns, similarities, and differences across studies. The synthesis process integrates findings to provide a comprehensive understanding of the research topic. This methodological approach enhances the validity and reliability of the study findings.

RESULTS AND DISCUSSION

Digitalization significantly enhances the effectiveness of strategic management control systems by improving data accessibility, integration, and transparency within organizations. The findings indicate that digital tools enable real-time monitoring, allowing managers to evaluate performance continuously rather than periodically. This shift improves the ability of organizations to detect deviations and implement corrective actions on time. Furthermore, integrated systems support better communication across departments, reducing information silos and improving coordination. As a result, digitalization strengthens the alignment between strategic objectives and operational execution.

The role of enterprise resource planning (ERP) systems in strengthening management control systems is particularly evident across the reviewed studies. ERP systems facilitate the integration of financial and non-financial data into a unified platform, improving consistency and reliability. This integration allows organizations to perform more comprehensive performance evaluations and enhances decision-making accuracy. In addition, ERP systems contribute to improved efficiency in reporting processes and data management. Consequently, organizations that adopt ERP systems tend to demonstrate higher levels of control effectiveness and operational performance.

Artificial intelligence further enhances management control systems by introducing predictive and adaptive capabilities into organizational processes. AI enables automated monitoring, anomaly detection, and real-time analysis of large datasets, which significantly improves the reliability of control mechanisms. These capabilities allow organizations to anticipate risks and respond proactively rather than reactively. Moreover, AI supports the development of adaptive control systems that can adjust to dynamic business environments. This transformation represents a shift toward more sophisticated and data-driven control practices.

Digitalization also plays a critical role in improving performance measurement systems by enhancing the accuracy, relevance, and timeliness of information. Real-time data collection allows organizations to monitor performance continuously and respond quickly to changes in the business environment. Additionally, digital tools enable the integration of multiple performance indicators, including both financial and non-financial metrics. This integration provides a more comprehensive understanding of organizational performance. As

a result, performance measurement systems become more strategic and aligned with organizational goals.

The integration of predictive analytics into performance measurement systems further strengthens their effectiveness. Predictive models allow organizations to forecast future performance trends based on historical and real-time data. This capability enables managers to identify potential opportunities and risks before they materialize. Furthermore, predictive analytics enhances the quality of decision-making by providing data-driven insights. Consequently, organizations can adopt a more proactive approach to performance management.

Digitalization also contributes to the development of more comprehensive and multidimensional performance indicators. Advanced analytical tools enable organizations to analyze complex relationships between different performance variables. This capability improves the ability of managers to understand the underlying drivers of performance. In addition, automated systems reduce human error and improve reporting efficiency. These improvements enhance the overall reliability and usefulness of performance measurement systems.

In terms of strategic decision-making, digitalization significantly improves the quality and speed of decision processes within organizations. The availability of integrated and real-time data enables managers to make more informed decisions. This access reduces uncertainty and enhances the ability to evaluate multiple strategic alternatives. Furthermore, digital tools facilitate collaboration and coordination among decision-makers. As a result, organizations can respond more effectively to dynamic and competitive environments.

The use of advanced analytics and artificial intelligence further strengthens strategic decision-making processes. These technologies enable organizations to shift from reactive to proactive decision-making approaches. AI provides deeper insights by analyzing large volumes of data and identifying patterns that are not easily detectable by humans. Additionally, predictive analytics supports scenario analysis and strategic planning. This capability enhances the overall effectiveness of decision-making processes.

Despite the benefits of digitalization, several challenges remain in its implementation. Organizations often face issues related to data quality, system integration, and technological infrastructure. In addition, resistance to change among employees can hinder the adoption of digital systems. These challenges highlight the importance of effective change management and organizational readiness. Addressing these issues is essential to fully leverage the potential of digital technologies.

Overall, the findings demonstrate that digitalization has a transformative impact on strategic management accounting practices. It enhances management control systems, improves performance measurement, and strengthens decision-making processes. However, the extent of these benefits depends on the organization’s ability to integrate technology effectively. Organizations must also invest in human capital and develop digital competencies. Therefore, a holistic approach to digital transformation is necessary to achieve sustainable performance improvements.

CONCLUSION

This study concludes that digitalization plays a fundamental role in transforming strategic management accounting practices across modern organizations. The integration of digital technologies significantly enhances management control systems by improving data accessibility, monitoring capabilities, and strategic alignment. Furthermore, digitalization strengthens performance measurement systems by enabling real-time data processing, improving accuracy, and integrating financial and non-financial indicators. These improvements allow organizations to evaluate performance more comprehensively and respond more effectively to dynamic business environments. In addition, digitalization enhances strategic decision-making processes by providing more relevant, timely, and data-driven information. This enables managers to evaluate alternatives more objectively and make better-informed decisions.

However, the effectiveness of digitalization is highly dependent on organizational readiness, technological infrastructure, and the competencies of human resources. Organizations that lack digital capabilities may not fully benefit from technological advancements. Therefore, investments in digital skills development and organizational change management are essential. Moreover, challenges related to data quality, system integration, and resistance to change must be addressed to ensure successful implementation.

From a theoretical perspective, this study contributes to the development of strategic management accounting literature by providing a comprehensive understanding of how digitalization influences control systems, performance measurement, and decision-making processes. From a practical perspective, the findings offer valuable insights for managers and policymakers in designing effective digital transformation strategies. Ultimately, digitalization should not be viewed merely as a technological tool but as a strategic enabler that supports organizational competitiveness and long-term sustainability.

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