

ALIGNING MANAGEMENT ACCOUNTING AND ACCOUNTING INFORMATION SYSTEMS FOR BETTER DECISIONS IN MALAYSIAN SMES

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Abstract: *Small and medium enterprises (SMEs) are central to the Malaysian economy, yet many continue to rely on basic accounting routines that limit the quality of managerial decisions. Management accounting practices (MAPs) and accounting information systems (AIS) have each been studied extensively, but they are usually examined in isolation, leaving limited understanding of how the two jointly shape decision-making in resource-constrained firms. This conceptual paper addresses that gap by proposing an integrated framework that links MAPs, AIS capability and the alignment between them to decision-making effectiveness and, in turn, to the sustainable performance of Malaysian SMEs. Drawing on contingency theory, the resource-based view and information processing theory, the paper synthesises classic and recent literature to develop six research propositions. The framework positions AIS capability as an enabler of contemporary MAPs, treats MAP-AIS alignment as a distinct organisational capability, and recognises the moderating roles of perceived environmental uncertainty and owner-manager digital and accounting competence. The paper contributes to the management accounting and AIS literature by bridging two research streams that rarely meet in the SME context, and it offers practical guidance for owner-managers, accounting professionals and policymakers pursuing digitalisation. Empirical operationalisation and testing are recommended for future research.*

Keywords: *Management Accounting Practices, Accounting Information Systems, Decision-Making Effectiveness, SMEs, Malaysia*

Introduction

Micro, small and medium enterprises (MSMEs) form the backbone of the Malaysian economy. According to the Department of Statistics Malaysia (DOSM, 2026), the gross domestic product of MSMEs grew by 5.7 per cent in 2025 to RM689.8 billion, representing 39.7 per cent of national GDP, while the sector accounted for 48.7 per cent of total employment. These figures confirm that the competitiveness of SMEs is not only a business concern but also a national development priority. Policy initiatives such as the Malaysia Digital Economy Blueprint (Economic Planning Unit, 2021) have further placed digital transformation at the centre of the SME agenda, encouraging firms to adopt technology that improves productivity, transparency and decision-making.

Despite this policy momentum, many SMEs continue to treat accounting primarily as a compliance function, focused on bookkeeping, statutory reporting and tax obligations, rather than as a source of information for planning, control and strategic choice (Mitchell & Reid, 2000; Nandan, 2010). Owner-managers frequently make decisions on intuition and incomplete information, which exposes their firms to cost overruns, pricing errors, cash flow difficulties and missed opportunities. In an environment marked by rising input costs, supply chain disruption and rapid technological change, the gap between the information SMEs need and the information they use has become increasingly consequential.

This gap is significant because decisions in small firms are concentrated in the owner-manager, who must interpret financial signals, set prices, approve investments and allocate scarce resources without the support of a specialised finance function. Decision makers operate under bounded rationality (Simon, 1997), and in SMEs these limits are particularly tight, so the design of the accounting information that reaches the owner-manager can make a substantial difference to decision quality and, ultimately, to firm survival and growth.

Two bodies of accounting knowledge speak directly to this problem. The first is management accounting, which provides techniques for costing, budgeting, performance evaluation, decision support and strategic analysis (Abdel-Kader & Luther, 2008; Chenhall, 2003). Studies of SMEs consistently report that traditional practices such as budgeting and basic costing dominate, while contemporary practices such as activity-based costing, the balanced scorecard and strategic management accounting are adopted far less often (Ahmad, 2017; Lavia López & Hiebl, 2015). The second is the accounting information system (AIS) literature, which examines how technology captures, processes and communicates accounting data to users (Romney & Steinbart, 2018). Research in Malaysia has shown that the alignment between AIS requirements and AIS capacity is associated with better SME performance (Ismail & King, 2005, 2007), and international studies continue to link AIS quality and use to organisational outcomes (Lutfi, 2022; Lutfi et al., 2022; Soudani, 2012).

However, these two streams have largely developed in parallel. Management accounting studies tend to treat information technology as a background condition, while AIS studies tend to treat accounting information as a generic output without specifying which management accounting practices it supports. Research on enterprise resource planning (ERP) systems found only a moderate impact of technology on management accounting (Granlund & Malmi, 2002), and more recent work on digitalisation, business intelligence and analytics suggests that the relationship between technology and management accounting is evolving rapidly but remains under-theorised (Arkhipova et al., 2024; Knudsen, 2020; Möller et al., 2020; Rikhardsson & Yigitbasioglu, 2018). Much of this recent work focuses on large organisations, leaving the SME

context comparatively neglected, even though SMEs face sharper resource constraints and rely more heavily on the owner-manager as the principal user of accounting information.

The issue is also relevant to the wider entrepreneurship agenda. Many Malaysian SMEs are family-owned, community-based or socially oriented and must balance economic viability with social and environmental expectations, which increases their need for reliable, decision-relevant information (Elkington, 1997).

This paper responds to these concerns by asking a central question: how do management accounting practices and accounting information systems jointly contribute to decision-making effectiveness and sustainable performance in Malaysian SMEs? To address this question, the paper pursues three objectives. First, it reviews the literature on MAPs and AIS in the SME context. Second, it integrates contingency theory, the resource-based view and information processing theory to explain why MAPs and AIS should be studied together. Third, it proposes a conceptual framework and a set of research propositions that can guide future empirical work. Consistent with its conceptual nature, the paper does not develop measurement instruments; operationalisation is deferred to future research.

The paper contributes theoretically by integrating two literatures rarely combined at the level of the small firm, practically by giving owner-managers and advisers a rationale for coordinating investments in systems and practices, and from a policy standpoint by offering a way to evaluate SME digitalisation in terms of decision quality. Section 2 reviews the literature, Section 3 presents the theoretical underpinnings, Section 4 develops the framework and propositions, Section 5 discusses implications, and Section 6 concludes.

Literature Review

Management Accounting Practices in SMEs

Management accounting is concerned with the identification, measurement, analysis and communication of information that helps managers plan, control and make decisions. Chenhall (2003) distinguishes management accounting systems, which refer to the systematic use of management accounting to achieve organisational goals, from the broader notion of management control systems, which also include personal and clan controls. Within this domain, management accounting practices are commonly grouped into five categories: costing systems, budgeting, performance evaluation, information for decision-making, and strategic analysis (Abdel-Kader & Luther, 2008).

The International Federation of Accountants (IFAC, 1998) describes the evolution of management accounting through four stages, moving from cost determination and financial control to information for management planning and control, to waste reduction, and finally to value creation through the effective use of resources. Practices associated with the earlier stages, such as budgeting and standard costing, are often labelled traditional, while those associated with the later stages, including activity-based costing, benchmarking, the balanced scorecard (Kaplan & Norton, 1996) and strategic management accounting, are labelled contemporary. Contemporary practices typically demand broader, timelier and more integrated information than traditional ones.

The distinction matters because traditional practices may give misleading signals. Volume-based costing can distort product costs when overheads are large and products diverse, leading

to poor pricing and product-mix decisions (Cooper & Kaplan, 1988), and the balanced scorecard extends performance evaluation beyond financial measures (Kaplan & Norton, 1996). Both innovations require more detailed and diverse data than a basic bookkeeping system captures.

Evidence from SMEs shows a consistent pattern. Smaller firms adopt fewer and simpler practices, and adoption increases with firm size, competition, ownership structure and the presence of qualified accounting staff (Abdel-Kader & Luther, 2008; Lavia López & Hiebl, 2015). In Malaysia, Ahmad (2017) found that SMEs make greater use of budgeting and costing than of strategic and performance evaluation tools, and that the use of management accounting practices is positively related to firm performance. Garengo et al. (2005) reported that performance measurement systems in SMEs are often informal and financially oriented, reflecting limited managerial resources and a short-term operational focus. Mitchell and Reid (2000) and Nandan (2010) argue that SMEs represent a distinctive setting in which management accounting is often informal, owner-centred and constrained by limited expertise, which means that frameworks developed for large firms cannot simply be transferred to smaller ones.

Early adoption of management accounting can also benefit growing firms: start-ups that adopted operating budgets earlier tended to grow faster (Davila & Foster, 2005), and broad-scope management accounting information is associated with managerial effectiveness (Mia & Chenhall, 1994). The question for SMEs is therefore not whether management accounting is relevant, but which practices are appropriate and how they can be supported at reasonable cost.

Accounting Information Systems in SMEs

An accounting information system is a system that collects, records, stores and processes data to produce information for decision makers (Romney & Steinbart, 2018). It comprises people, procedures, data, software, information technology infrastructure and internal controls. For SMEs, AIS range from basic computerised bookkeeping packages to cloud-based accounting platforms and integrated ERP solutions. The choice and configuration of these systems determine not only the efficiency of transaction processing but also the type, detail and timeliness of information available for management.

The value of an AIS is commonly assessed through the information systems success model of DeLone and McLean (2003), which identifies system quality, information quality and service quality as determinants of use, user satisfaction and net benefits. Sajady et al. (2008) and Soudani (2012) show that an effective AIS improves the quality of financial reports, internal control and organisational performance. In the Malaysian SME context, Ismail and King (2005) demonstrated that firms achieving a high level of alignment between AIS requirements and AIS capacity enjoy superior performance, and Ismail and King (2007) found that this alignment is influenced by owner-manager knowledge, the presence of internal IT expertise and external support.

Studies of IS adoption in small businesses emphasise the chief executive, whose innovativeness and IS knowledge shape adoption (Thong, 1999). More recently, top management support and self-efficacy have been shown to drive the continued use of AIS in SMEs (Lutfi, 2022), and digital accounting system use has been associated with SME performance (Lutfi et al., 2022). The benefits of an AIS in small firms therefore depend heavily on how the owner-manager understands and uses it.

Cloud computing, real-time dashboards, big data and analytics now allow even small firms to access information previously available only to large organisations (Al-Htaybat & von Alberti-Alhtaybat, 2017; Bhimani & Willcocks, 2014), and internet-related technologies are reshaping the work of accountants (Moll & Yigitbasioglu, 2019). For SMEs, subscription-based cloud accounting lowers entry costs, although questions remain about data security, skills and how far owner-managers exploit the analytical features available.

The Intersection of Management Accounting and AIS

The relationship between technology and management accounting has been examined most extensively in research on management accounting change. Burns and Scapens (2000) conceptualise management accounting as a set of rules and routines that become institutionalised over time, implying that new systems must be absorbed into existing routines before they change practice. Burns and Vaivio (2001) observe that information technology is one of several forces that reshape management accounting. Granlund and Malmi (2002), studying ERP adoption, found that the impact on management accounting techniques was moderate, partly because organisations implemented technology without redesigning the practices it was meant to support. These findings suggest that technology alone is insufficient; benefits depend on how well systems and practices fit together.

Further evidence for the importance of integration comes from Chapman and Kihn (2009), who found that information system integration was associated with enabling forms of control, which in turn were linked to perceived system success and business unit performance. Their study indicates that integration matters not merely as a technical attribute but because it shapes how managers interact with accounting information. Appelbaum et al. (2017) similarly argue that business analytics and enterprise systems have the potential to transform managerial accounting, and they propose a framework, organised around the balanced scorecard perspectives, that links data analytics to management accounting functions.

Research on digitalisation has renewed attention to this relationship. Business intelligence and analytics are a growing but fragmented topic in management accounting research (Rikhardsson & Yigitbasioglu, 2018), and scholars call for deeper theorisation of how digital technologies alter accounting work (Knudsen, 2020; Möller et al., 2020). Automation changes both the tasks and roles of management accountants (Andreassen, 2020; Korhonen et al., 2021; Arkhipova et al., 2024), who increasingly need data and analytics skills (Kroon et al., 2021; Nielsen, 2022; Oesterreich & Teuteberg, 2019; Spraakman et al., 2021). Yet more abundant information does not automatically produce wiser decisions, because judgement remains essential (Quattrone, 2016). Overall, the usefulness of management accounting depends increasingly on its information infrastructure, and the value of an AIS depends on the management accounting purposes it serves.

Decision-Making Effectiveness and SME Sustainable Performance

Decision-making effectiveness refers to the extent to which managerial decisions are timely, well-informed, consistent with organisational objectives and successful in achieving intended outcomes. Chenhall and Morris (1986) show that the perceived usefulness of management accounting information depends on four characteristics: broad scope, timeliness, appropriate aggregation and integration. Gordon and Narayanan (1984) similarly found that managers facing uncertain environments value external, non-financial and future-oriented information. These characteristics describe precisely what a well-designed combination of MAPs and AIS can provide.

How managers use accounting information also matters. Managers often draw on it through conversation and combine it with other knowledge (Hall, 2010), and control information can be used interactively to stimulate dialogue and learning as well as diagnostically to monitor results (Simons, 1995). Such interactive use may be especially relevant in SMEs, where the owner-manager is close to operations.

Sustainable performance extends beyond short-term profitability to the firm's capacity to create economic and social value over time, as reflected in the balanced scorecard (Kaplan & Norton, 1996) and the triple bottom line (Elkington, 1997). For SMEs, it means remaining viable while contributing to employment and local development, and better decisions are the mechanism through which improved information is expected to produce it.

The Malaysian SME Context

The Malaysian setting is particularly relevant for examining the integration of management accounting and AIS. MSMEs account for close to two-fifths of national GDP and almost half of total employment (DOSM, 2026), yet they range from single-owner micro enterprises to medium-sized manufacturers with established finance functions, so the appropriate combination of practices and systems is likely to differ across firms. National policy, notably the Malaysia Digital Economy Blueprint (Economic Planning Unit, 2021), encourages SMEs to adopt digital tools, and accounting software is often the first point of entry. However, adoption driven mainly by compliance may produce systems used for bookkeeping rather than management (Granlund & Malmi, 2002). Malaysian evidence on AIS alignment (Ismail & King, 2005, 2007) and on MAPs (Ahmad, 2017) exists, but the two streams are rarely connected, leaving unclear whether firms with stronger systems use more advanced practices and whether alignment between them matters for decisions.

Synthesis and Research Gap

Table 1 summarises selected studies that inform the present framework. The review reveals three gaps. First, studies of MAPs in SMEs rarely specify the information systems that make these practices feasible, while studies of AIS in SMEs rarely specify the management accounting purposes the system is meant to serve. Second, although alignment has been studied in the AIS literature (Ismail & King, 2005, 2007), alignment between management accounting practices and system capability has received limited attention. Third, most studies link MAPs or AIS directly to performance, leaving the intervening role of decision-making effectiveness largely implicit. The framework developed in this paper is designed to address these gaps.

Table 1: Summary of Selected Prior Studies Informing the Framework

Author(s)	Context / Approach	Key Insight Relevant to this Paper
Chenhall & Morris (1986)	Managers in manufacturing firms; survey	Usefulness of MAS information depends on broad scope, timeliness, aggregation and integration.
Granlund & Malmi (2002)	Firms adopting ERP; field study	ERP systems had only a moderate impact on management accounting techniques.
Ismail & King (2005)	Malaysian SMEs; survey	Alignment between AIS requirements and AIS capacity is associated with firm performance.

Author(s)	Context / Approach	Key Insight Relevant to this Paper
Abdel-Kader & Luther (2008)	UK food and drinks firms; survey	Firm characteristics such as size and environment explain the sophistication of MAPs.
Chapman & Kihn (2009)	Business units; survey	Information system integration supports enabling control and performance.
Lavia López & Hiebl (2015)	SMEs; literature review	MAPs in SMEs are less sophisticated and shaped by size, ownership and expertise.
Ahmad (2017)	Malaysian SMEs; survey	Use of MAPs, mainly budgeting and costing, is positively related to performance.
Lutfi et al. (2022)	SMEs; survey	Digital accounting system usage is positively associated with SME performance.

Source: Compiled by the authors

Table 1 shows that the selected studies fall into three groups, which together explain the need for the present framework. The first group establishes what makes management accounting information useful and how its use varies. Chenhall and Morris (1986) identify broad scope, timeliness, aggregation and integration as the characteristics that managers value, while Abdel-Kader and Luther (2008) and Lavia López and Hiebl (2015) show that the sophistication of MAPs depends on firm characteristics and is generally lower in SMEs. Ahmad (2017) confirms that, among Malaysian SMEs, budgeting and costing dominate and the use of MAPs is positively related to performance. The second group concerns information systems. Ismail and King (2005) link AIS alignment to the performance of Malaysian SMEs, and Lutfi et al. (2022) associate the use of digital accounting systems with SME performance. The third group sits at the intersection of the two streams. Granlund and Malmi (2002) show that new enterprise systems had only a moderate impact on management accounting techniques, while Chapman and Kihn (2009) find that the benefits of system integration depend on whether it supports enabling forms of control.

Reading across the table reveals three patterns that shape the framework. First, most of the studies are surveys that examine one stream at a time, so they offer little evidence on how practices and systems interact within the same firm. Second, studies on both sides point to fit as the source of value. Information is useful when it matches managers' needs (Chenhall & Morris, 1986), and systems improve performance when their capacity matches the firm's requirements (Ismail & King, 2005), yet these two ideas of fit have not been combined. Third, most studies relate practices or systems directly to performance without examining the quality of the decisions through which such effects are expected to occur. These patterns correspond to the three gaps identified above and justify the central place of MAP-AIS alignment and decision-making effectiveness in the framework developed in Section 4.

Theoretical Underpinnings

Contingency Theory

Contingency theory holds that there is no universally appropriate accounting system; rather, the design and effectiveness of management accounting depend on the fit between the system and contextual factors such as environment, technology, structure, size and strategy (Chenhall,

2003; Otley, 1980). Gordon and Narayanan (1984) showed that perceived environmental uncertainty is associated with demand for broader management accounting information, and Chenhall and Morris (1986) linked uncertainty and interdependence to the perceived usefulness of information characteristics.

A central concept in contingency research is fit. Venkatraman (1989) distinguishes several perspectives on fit, each implying a different theoretical meaning and empirical test. This paper uses fit in two senses: as matching, in the concept of MAP-AIS alignment, and as moderation, in the roles of environmental uncertainty and owner-manager competence.

Resource-Based View

The resource-based view (RBV) argues that sustained competitive advantage arises from resources that are valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991). Accounting software is widely available and therefore unlikely to be a source of advantage. However, Bharadwaj (2000) showed that firms with superior IT capability, understood as the ability to mobilise and deploy IT-based resources in combination with other resources, outperform comparable firms. This insight suggests that the source of advantage lies not in the technology itself but in the way it is combined with organisational routines and knowledge. From this perspective, an AIS combined with management accounting routines tailored to the firm and supported by the owner-manager's knowledge is far harder to imitate than either component alone. The dynamic capabilities perspective (Teece et al., 1997) adds that such capabilities can be reconfigured as conditions change, so MAP-AIS alignment can be viewed as a renewable organisational capability that supports superior decisions.

Information Processing Theory

Information processing theory (Galbraith, 1973) proposes that organisations must match their information processing capacity to the information processing requirements created by task uncertainty. When uncertainty increases, firms need either to reduce their information requirements or to increase their capacity through vertical information systems and lateral relations. In this framework, MAPs define what information is required and how it should be analysed, while the AIS determines the capacity to capture, process and deliver that information. Effective decision-making occurs when requirements and capacity are matched. This theory is closely related to the strategic alignment perspective in information systems research, which holds that the value of IT depends on its fit with business strategy and processes (Henderson & Venkatraman, 1993). It also underpins the AIS alignment perspective of Ismail and King (2005), which the present paper narrows to the information requirements created by specific MAPs.

Integrating the Theories

The three theories are complementary. Information processing theory explains the mechanism, namely that decisions improve when information requirements are matched by information capacity. Contingency theory explains when the mechanism is stronger or weaker, by highlighting contextual factors such as uncertainty and competence. The RBV explains why the resulting capability can produce sustained performance benefits. The Technology-Organisation-Environment perspective (Tornatzky & Fleischer, 1990) further supports the inclusion of owner-manager competence and environmental conditions as factors that shape how technology is adopted and used in small firms, a view consistent with empirical evidence on IS adoption in small businesses (Thong, 1999). Together, these lenses provide a coherent foundation for the framework presented in the next section.

The way the theories map onto the framework can be stated more precisely. Information processing theory underpins the core pathway from MAPs, AIS capability and their alignment to decision-making effectiveness (P1 to P4), because each of these constructs describes either the information required for decisions or the capacity to supply it. The RBV underpins the treatment of alignment as a distinctive capability (P4) and the link between better decisions and sustainable performance (P5). Contingency theory underpins the two moderating propositions (P6a and P6b), which specify that the value of practices and systems depends on the environment and on the competence of the people who use them. This mapping ensures that each proposition rests on an explicit theoretical rationale rather than on empirical association alone.

Proposed Conceptual Framework and Propositions

Building on the literature and theories reviewed above, Figure 1 presents the proposed conceptual framework. The framework comprises three antecedent constructs (MAPs, AIS capability and MAP-AIS alignment), one intervening construct (decision-making effectiveness), one outcome construct (SME sustainable performance) and two moderating constructs (perceived environmental uncertainty and owner-manager digital and accounting competence). Solid arrows represent proposed direct relationships, while dashed arrows represent proposed moderating effects.

Figure 1 can be read as three layers that move from left to right. The first layer contains the two foundational elements of an SME's accounting infrastructure: management accounting practices, which determine what information the owner-manager needs and how it is analysed, and AIS capability, which determines how efficiently that information can be captured, processed and delivered. The second layer, at the centre, is MAP-AIS alignment, which represents the point at which practices and systems meet. The third layer, on the right, shows the outcomes of this integration, first in the quality of decisions and then in the sustainable performance of the firm. This left-to-right ordering reflects the logic of information processing theory, in which information requirements and processing capacity must be matched before they can improve decisions (Galbraith, 1973).

The figure distinguishes three types of direct relationship. The vertical arrow from AIS capability to MAPs (P3) captures the enabling role of technology, since a capable system lowers the cost of the data that contemporary practices require and therefore makes their adoption more feasible. The two long diagonal arrows (P1 and P2) represent the separate contributions that practices and systems make to decision-making effectiveness. The two shorter arrows that converge on MAP-AIS alignment show that alignment is formed jointly by practices and systems, while the arrow from alignment to decision-making effectiveness (P4) captures the additional value that arises when the two fit together. Placing alignment at the centre of the figure is deliberate. It expresses the paper's core argument that the combination of practices and systems, rather than either element in isolation, is the main source of decision value (Chapman & Kihn, 2009; Ismail & King, 2005).

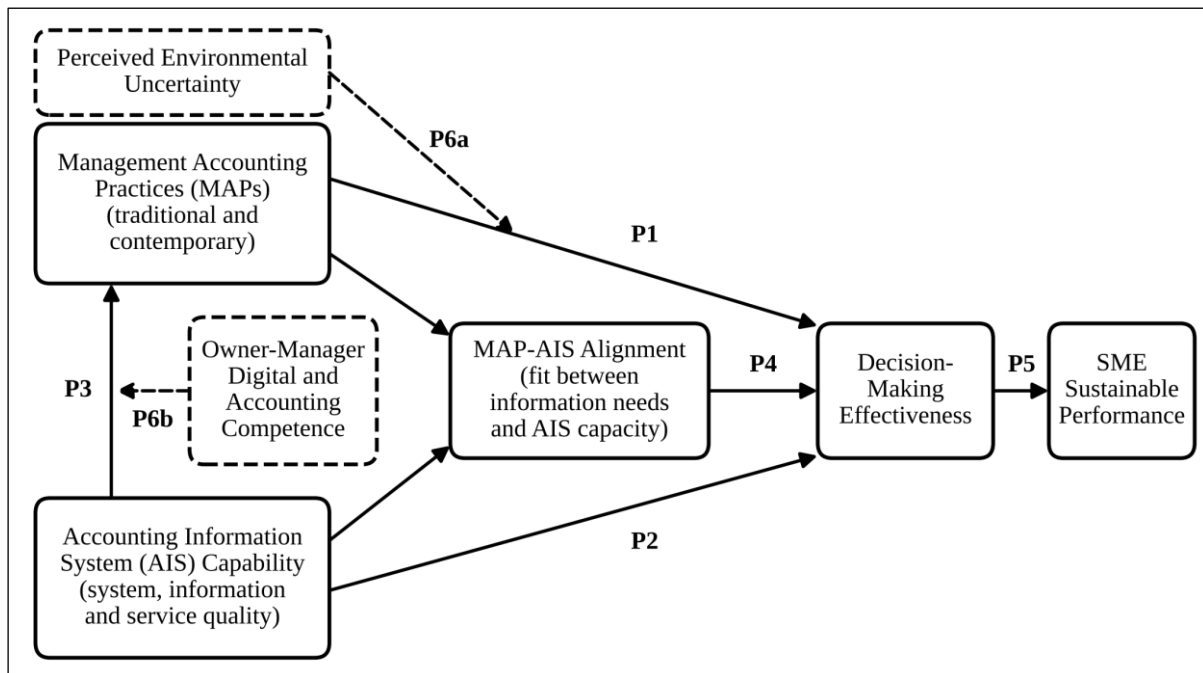


Figure 1: Proposed Conceptual Framework of MAP-AIS Integration and Decision-Making Effectiveness in Malaysian SMEs

Source: Developed by the authors

Decision-making effectiveness occupies a mediating position between the accounting infrastructure and SME sustainable performance (P5). This placement makes explicit a mechanism that prior studies linking MAPs or AIS directly to performance have often left implicit (Ahmad, 2017; Ismail & King, 2005). It implies that improvements in practices or systems should become visible first in the timeliness, confidence and quality of decisions, and only afterwards in financial and non-financial outcomes. The final arrow to sustainable performance also signals that the framework is concerned with the long-term viability and broader value creation of SMEs, rather than with short-term profit alone (Elkington, 1997; Kaplan & Norton, 1996).

The two dashed boxes represent contextual conditions rather than direct causes. Perceived environmental uncertainty, shown at the top of the figure, is expected to strengthen the link between MAPs and decision-making effectiveness (P6a), because uncertain conditions raise the value of broad, timely and forward-looking information (Gordon & Narayanan, 1984). Owner-manager digital and accounting competence, shown between the two foundational constructs, is expected to strengthen the link between AIS capability and the use of MAPs (P6b), because a system's potential is realised only when its user understands both the technology and the accounting logic it supports (Ismail & King, 2007; Thong, 1999). Each moderator is placed next to the specific path it affects rather than treated as a general influence on the whole model. This is consistent with the interpretation of fit as moderation (Venkatraman, 1989) and keeps each moderating proposition precise enough to be tested.

Read as a whole, Figure 1 presents a coherent account of how accounting creates value in small firms. Systems make practices possible, practices and systems together create aligned information, aligned information improves decisions, and better decisions sustain performance, with the strength of these links depending on the environment and on the people involved. The framework is intentionally parsimonious. It includes only those constructs for which there is a

clear theoretical rationale and prior empirical support, so that it can be tested in future studies without becoming unwieldy.

Table 2 complements Figure 1 by setting out the conceptual definition, theoretical anchor and key sources for each construct. Clear definitions are essential in conceptual research because they establish the boundaries of each construct, reduce overlap between related ideas and provide the starting point for future operationalisation.

Table 2: Summary of Constructs in the Proposed Framework

Construct	Conceptual Definition	Theoretical Anchor	Key Sources
Management accounting practices (MAPs)	The extent to which an SME uses costing, budgeting, performance evaluation, decision support and strategic analysis techniques, both traditional and contemporary.	Contingency theory	Abdel-Kader & Luther (2008); Ahmad (2017)
AIS capability	The quality of the accounting information system in terms of system quality, information quality and service quality.	RBV; IS success model	DeLone & McLean (2003); Romney & Steinbart (2018)
MAP-AIS alignment	The degree of fit between the information requirements created by MAPs and the information capacity provided by the AIS.	Information processing theory; RBV	Galbraith (1973); Ismail & King (2005); Venkatraman (1989)
Decision-making effectiveness	The extent to which managerial decisions are timely, well-informed and successful in achieving intended outcomes.	Information processing theory	Chenhall & Morris (1986); Mia & Chenhall (1994)
SME sustainable performance	Multidimensional financial and non-financial performance that sustains the firm's economic and social value over time.	RBV	Elkington (1997); Kaplan & Norton (1996)
Perceived environmental uncertainty	The owner-manager's perception of unpredictability in customers, competitors, technology and regulation.	Contingency theory	Gordon & Narayanan (1984)
Owner-manager digital and accounting competence	The owner-manager's knowledge and skills in using digital tools and interpreting accounting information.	Contingency theory; TOE	Ismail & King (2007); Thong (1999)

Source: Developed by the authors

Three features of Table 2 deserve emphasis. First, each construct is defined at the level of the SME and from the perspective of its principal decision maker, usually the owner-manager. MAPs are defined by the extent of their use rather than by their mere existence, which recognises that many SMEs prepare budgets or cost estimates informally and irregularly (Garengo et al., 2005; Mitchell & Reid, 2000). AIS capability is defined by quality rather than by the type or price of software, following the IS success model (DeLone & McLean, 2003). Under this definition, a modest but reliable cloud accounting package may represent higher capability than an expensive system that is poorly maintained or rarely used.

Second, the table draws a clear distinction between MAP-AIS alignment and its two component constructs. MAPs describe the demand side of information, AIS capability describes the supply side, and alignment describes the match between the two. This distinction matters because a firm can score highly on both MAPs and AIS capability yet still be poorly aligned, for example when an advanced system is configured mainly for statutory reporting while the owner-manager relies on separate spreadsheets for costing and budgeting. Treating alignment as a separate construct, anchored in information processing theory (Galbraith, 1973) and earlier work on AIS alignment (Ismail & King, 2005), allows future research to test whether fit adds explanatory power beyond the separate effects of practices and systems, as proposed in P4. In the same way, decision-making effectiveness is defined by the qualities of decisions rather than by their financial results. This keeps it conceptually separate from SME sustainable performance and allows the mediating role proposed in P5 to be examined.

Third, the theoretical anchors in Table 2 show how the three theories divide the explanatory work across the framework. Contingency theory anchors the constructs that describe the setting in which accounting is used, namely MAPs, perceived environmental uncertainty and owner-manager competence (Chenhall, 2003; Otley, 1980). Information processing theory anchors the constructs that describe the flow of information into decisions, namely MAP-AIS alignment and decision-making effectiveness. The RBV anchors the constructs that relate to capability and performance, namely AIS capability, alignment and sustainable performance (Barney, 1991; Bharadwaj, 2000). The key sources listed for each construct also indicate where established measurement approaches may be found, which will help future researchers to develop instruments suited to the Malaysian SME context. In this sense, Table 2 serves both as a conceptual summary of the framework and as a bridge to the empirical research recommended in Section 6.

Management Accounting Practices and Decision-Making Effectiveness

Management accounting practices provide the analytical tools through which raw data are converted into information for planning, control and choice. Budgeting supports resource allocation and coordination, costing supports pricing and product decisions, performance evaluation supports monitoring and accountability, and strategic analysis supports long-term positioning (Abdel-Kader & Luther, 2008). Contemporary practices, in particular, supply information that is broad in scope, future-oriented and integrated across functions, which Chenhall and Morris (1986) associate with greater perceived usefulness and which Mia and Chenhall (1994) associate with managerial effectiveness.

For SMEs, the practical consequences are tangible. An owner-manager who understands the full cost of serving different customers can avoid unprofitable orders; one who prepares a cash budget can anticipate shortfalls and negotiate financing early; and one who monitors a small set of non-financial indicators can detect problems in quality or delivery before they affect revenue.

Evidence from Malaysian SMEs indicates that the use of MAPs is positively related to performance (Ahmad, 2017), and the most plausible channel for that relationship is the quality of decisions made by owner-managers. Accordingly, the following proposition is advanced:

P1: The extent of use of management accounting practices, particularly contemporary practices, is positively associated with decision-making effectiveness in Malaysian SMEs.

AIS Capability and Decision-Making Effectiveness

AIS capability refers to the extent to which the accounting information system provides reliable, accurate, timely and accessible information, supported by adequate system functionality and user support. Drawing on DeLone and McLean (2003), AIS capability can be understood in terms of system quality, information quality and service quality. A capable AIS reduces errors, shortens reporting cycles and allows owner-managers to access information when decisions must be made (Sajady et al., 2008; Soudani, 2012).

Cloud-based and analytics-enabled systems extend these benefits by enabling real-time monitoring, drill-down analysis and scenario planning (Appelbaum et al., 2017; Bhimani & Willcocks, 2014). For an owner-manager who must make frequent operational decisions, the ability to view current sales, receivables, inventory and margins on a single screen can shorten the time between a problem arising and a corrective action being taken. Evidence that digital accounting system use is associated with SME performance (Lutfi et al., 2022) is consistent with this reasoning. Hence:

P2: AIS capability is positively associated with decision-making effectiveness in Malaysian SMEs.

AIS Capability as an Enabler of Management Accounting Practices

The adoption of contemporary MAPs is often constrained by the cost and difficulty of collecting the data they require. Activity-based costing, for example, requires detailed data on activities and cost drivers (Cooper & Kaplan, 1988), while the balanced scorecard requires the regular capture of non-financial indicators (Kaplan & Norton, 1996). A capable AIS lowers these costs by automating data capture, integrating data across functions and producing reports at low marginal cost.

Technology creates opportunities for management accounting change, even if they are not always realised (Granlund & Malmi, 2002; Möller et al., 2020). An SME whose system records sales by customer, product and channel can analyse profitability along these dimensions with little extra effort, whereas a firm with a basic ledger must collect such data manually. Hence:

P3: AIS capability is positively associated with the extent of use of management accounting practices in Malaysian SMEs.

MAP-AIS Alignment and Decision-Making Effectiveness

Neither MAPs nor AIS capability alone guarantees better decisions. A sophisticated system that is not configured to support the firm's costing, budgeting and performance routines may produce volumes of data that owner-managers cannot use, while sophisticated practices without adequate system support may be applied inconsistently or abandoned. Both outcomes represent a misfit between information requirements and information capacity, which information processing theory predicts will reduce the effectiveness of decisions (Galbraith, 1973).

MAP-AIS alignment is therefore conceptualised as a distinct construct that captures the degree of fit between the information requirements created by MAPs and the information capacity provided by the AIS. This conception is consistent with the alignment perspective of Ismail and King (2005) and with the matching perspective of fit described by Venkatraman (1989). Evidence that integrated information systems support enabling forms of control and performance (Chapman & Kihn, 2009) lends further support. Consistent with the RBV (Barney, 1991; Bharadwaj, 2000), this alignment is a firm-specific capability that is harder to imitate than either component in isolation.

An illustration helps to clarify the concept. Consider two food-processing SMEs that each install the same cloud accounting package. The first configures the system to record costs by production line and to generate a monthly comparison of budgeted and actual margins, which the owner-manager reviews with the production supervisor. The second uses the system mainly to issue invoices and file tax returns, while the owner-manager continues to estimate product costs informally. Although both firms possess similar technology, only the first has aligned its system with its management accounting needs, and it is therefore better placed to detect unprofitable products and adjust prices. The framework predicts that such alignment, rather than technology ownership alone, explains differences in decision quality. Hence:

P4: MAP-AIS alignment is positively associated with decision-making effectiveness in Malaysian SMEs, over and above the separate effects of management accounting practices and AIS capability.

Decision-Making Effectiveness and SME Sustainable Performance

Accounting information creates value only when it is used to make better decisions. Improved pricing, cost control, investment appraisal, cash management and strategic positioning are the routes through which information affects financial and non-financial performance. Prior studies that link MAPs or AIS directly to performance (Ahmad, 2017; Ismail & King, 2005) implicitly assume this mechanism, and Quattrone (2016) reminds us that information becomes valuable only when it is interpreted and acted upon with judgement.

Making decision-making effectiveness explicit allows future research to test whether it mediates the effects of MAPs, AIS capability and their alignment on performance, and it recognises that two SMEs with identical systems and practices may achieve different outcomes because their owner-managers use the information differently. Viewed in sustainable terms (Elkington, 1997; Kaplan & Norton, 1996), good decisions may be reflected in customer loyalty, employee retention and community contribution as well as profit. Hence:

P5: Decision-making effectiveness is positively associated with SME sustainable performance and mediates the relationships between management accounting practices, AIS capability, MAP-AIS alignment and SME sustainable performance.

The Moderating Roles of Environmental Uncertainty and Owner-Manager Competence

Contingency theory suggests that the value of management accounting information is greater when environmental uncertainty is high, because managers then require broader, timelier and more forward-looking information (Chenhall & Morris, 1986; Gordon & Narayanan, 1984). Malaysian SMEs currently face uncertainty arising from cost pressures, changing regulations,

shifting consumer preferences and technological disruption. Under such conditions, practices such as rolling budgets, scenario analysis and customer profitability analysis provide information that helps owner-managers respond quickly, whereas under stable conditions simpler routines may suffice.

In addition, SMEs depend heavily on the owner-manager, who is often the main user and sponsor of accounting systems. Thong (1999) and Ismail and King (2007) found that the knowledge of the chief executive influences IS adoption and AIS alignment, and Lutfi (2022) showed that top management support and self-efficacy drive the continued use of AIS. Owner-managers with stronger digital and accounting competence are more likely to recognise the potential of their AIS and to translate system capability into appropriate management accounting routines. Where such competence is limited, even a capable system may be used only for bookkeeping. Hence:

P6a: Perceived environmental uncertainty positively moderates the relationship between management accounting practices and decision-making effectiveness, such that the relationship is stronger under higher uncertainty.

P6b: Owner-manager digital and accounting competence positively moderates the relationship between AIS capability and the use of management accounting practices, such that the relationship is stronger when competence is higher.

Boundary Conditions of the Framework

Several boundary conditions define the scope of the framework. It is designed for SMEs in which the owner-manager is the principal user of accounting information and which have at least a basic computerised AIS; in larger SMEs with dedicated finance managers, the competence in P6b may reside with the accountant instead. The framework does not imply that more sophisticated practices or systems are always preferable, since a simple but well-aligned combination may be more effective than an elaborate but poorly integrated one (Chenhall, 2003; Otley, 1980). Finally, it addresses the decision-support role of accounting rather than its stewardship or external reporting roles.

Discussion and Implications

Theoretical Implications

This paper makes four theoretical contributions. First, it bridges the management accounting and AIS literatures by conceptualising MAPs and AIS capability as complementary components of a single decision-support capability, rather than as independent determinants of performance. This integration responds to the observation that technology-driven change in management accounting has been moderate when systems and practices are not redesigned together (Granlund & Malmi, 2002).

Second, it introduces MAP-AIS alignment as a distinct construct grounded in information processing theory and the RBV, extending the work of Ismail and King (2005, 2007) to specific management accounting purposes and clarifying, through Venkatraman's (1989) typology, that alignment means matching requirements and capacity. Third, it makes decision-making effectiveness explicit as the mechanism linking accounting information to performance, responding to calls for deeper theorisation of digitalisation in management accounting (Knudsen, 2020; Möller et al., 2020). Fourth, by treating owner-manager competence as a

moderator, it connects management accounting research with the small business IS literature (Thong, 1999).

Practical Implications

For SME owner-managers, the framework suggests that investment in accounting software should be accompanied by a deliberate review of the management accounting practices the software is meant to support. Purchasing a system without redesigning costing, budgeting and performance routines is unlikely to improve decisions, a lesson consistent with early ERP experience (Granlund & Malmi, 2002). Conversely, firms that wish to adopt contemporary practices should first assess whether their AIS can supply the necessary data. A simple starting point is for owner-managers to list the decisions they make most often, identify the information each decision requires, and check whether their current system provides that information in a timely and usable form.

For accounting professionals and advisers, the framework highlights an advisory role beyond compliance, namely helping clients align systems and practices (Nandan, 2010). This role requires analytical and data competencies (Oesterreich & Teuteberg, 2019; Spraakman et al., 2021) and the ability to communicate information in ways owner-managers find meaningful (Hall, 2010).

Policy and Educational Implications

For policymakers, SME digitalisation programmes under the Malaysia Digital Economy Blueprint (Economic Planning Unit, 2021) would be more effective if grants for accounting technology were linked to training in costing, budgeting and performance measurement and to building owner-manager competence. Programme evaluation could also move from counting adopting firms to assessing whether adoption has improved the quality and timeliness of decisions.

For accounting educators, the framework reinforces the need to integrate management accounting and AIS in the curriculum, for example through case-based learning in which students configure a system to support a costing or budgeting practice and then use its output to make a decision (Kroon et al., 2021).

Implications for Entrepreneurial and Social Enterprises

The framework is also relevant to entrepreneurial and social ventures that operate with limited resources while pursuing multiple objectives. Early adoption of management accounting can support growth in young firms (Davila & Foster, 2005), and such adoption is more likely to succeed when supported by an appropriate information system. For social enterprises, aligning multidimensional performance measurement with system capability could improve both internal decisions and accountability to stakeholders.

Anticipated Challenges in Achieving MAP-AIS Alignment

Achieving MAP-AIS alignment is unlikely to be straightforward for many SMEs. Configuring systems to support specific costing or performance routines may require external expertise that small firms find costly, and owner-managers may lack the skills to design meaningful reports or interpret analytical output (Ismail & King, 2007; Thong, 1999). Analysis is also only as reliable as the underlying data, which many SMEs record inconsistently. In addition, accounting routines become institutionalised and resist change (Burns & Scapens, 2000), while reliance on cloud technologies raises concerns about data security and dependence on external providers

(Moll & Yigitbasioglu, 2019). These challenges help explain why many SMEs do not realise the full potential of their systems and indicate where advisory and policy support can be targeted.

Conclusion, Limitations And Future Research

This paper has argued that the contribution of accounting to SME decision-making depends not on management accounting practices or accounting information systems alone, but on how well the two are integrated. Drawing on contingency theory, the resource-based view and information processing theory, it proposed a conceptual framework in which AIS capability enables MAPs, MAP-AIS alignment acts as a distinct capability, decision-making effectiveness serves as the mechanism linking information to outcomes, and environmental uncertainty and owner-manager competence shape the strength of these relationships. Six propositions were developed to guide future research.

The central message of the paper is therefore one of integration: researchers should study management accounting and AIS together, owner-managers and advisers should design systems and practices with clear reference to the decisions they support, and policymakers should judge SME digitalisation by its effect on decision quality rather than by adoption rates alone.

As a conceptual paper, this study has limitations. The propositions have not been tested empirically, and measurement instruments are not specified. The focus on Malaysian SMEs means that applicability to other countries or to large firms requires further examination, and the framework does not distinguish between sectors whose information needs may differ. It also treats relationships as broadly linear, although thresholds may exist below which systems and practices yield little benefit.

Future research could operationalise the constructs and test the propositions with survey data from Malaysian SMEs using structural equation modelling. MAPs could be measured using established classifications (Abdel-Kader & Luther, 2008), AIS capability using the IS success dimensions (DeLone & McLean, 2003), and MAP-AIS alignment using matching approaches (Ismail & King, 2005; Venkatraman, 1989). Longitudinal designs would help establish the direction of the proposed relationships, since better-performing firms may also be more able to invest in systems and practices.

Case studies and mixed-methods designs could show how alignment develops over time and how owner-managers use accounting information in daily work (Hall, 2010), while comparative studies across sectors or ASEAN countries would help establish the boundaries of the framework. Future studies could also examine how artificial intelligence and advanced analytics alter MAP-AIS alignment in small firms (Arkhipova et al., 2024; Nielsen, 2022).

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