Pacific International Journal, Vol. 9(2); 2026
ISSN (Print) 2663-8991, ISSN (Online) 2616-4825[1]
DOI: 10.55014/pij.v9i2.1001
https://rclss.com/index.php/pij

Research on the Impact of Generative AI on the Quality of Management Accounting Decisions: Evidence from Manufacturing Firms

Xin Shen
University of the East, Manila, Philippines
shen.xin@ue.edu.ph

Abstract: Generative artificial intelligence (GenAI) is moving from experimentation to organizational infrastructure in accounting and finance. Yet firm-level evidence on how it shapes management accounting decision quality in manufacturing remains limited, especially in contexts where financial, operational, engineering, and service information are tightly intertwined. This paper revises the question in a more analytically cautious way: rather than claiming direct observation of internal decision processes, it examines what can reasonably be inferred from public corporate disclosures about the ways GenAI-related capabilities may influence management accounting decision quality. The study adopts an interpretive multiple-case design and analyzes three major Chinese manufacturing firms - Midea Group, Haier Smart Home, and Dongfang Electric - using official annual and semi-annual reports, corporate disclosures, and recent AI-and-accounting literature. The findings suggest that GenAI does not improve management accounting decision quality primarily by replacing managerial judgment. Instead, its potential effects appear to operate through three linked mechanisms: information enrichment, analytical augmentation, and organizational embedding. First, GenAI-related capabilities broaden the informational basis of management accounting by making operational, service, quality, and ecosystem data more usable in planning and control. Second, they enhance analysis by translating complex data into more interpretable, scenario-sensitive, and action-oriented outputs. Third, these benefits are likely to materialize only when AI capabilities are embedded in standardized routines, integrated data infrastructures, and cross-functional governance arrangements. At the same time, the documentary evidence also indicates important boundary conditions, including data maturity, process integration, governance discipline, and the degree of functional trust between finance and operating units. The paper contributes by sharpening the concept of management accounting decision quality, distinguishing GenAI from broader digital transformation, and offering a cautious process model grounded in documentary case evidence from leading Chinese manufacturers. Because the evidence is drawn primarily from external disclosures rather than direct internal observation, the claims should be read as interpretive analytical inferences rather than as definitive causal proof.

Keywords: generative artificial intelligence; management accounting; decision quality; manufacturing firms; documentary case study; digital transformation

1. **Introduction**

Generative artificial intelligence has become one of the most consequential technological developments in the contemporary accounting landscape. Professional and academic discussions increasingly suggest that AI in accounting is shifting from narrow automation to a broader role in information processing, analysis, advisory work, and organizational coordination [1], [2]. These developments are especially relevant to management accounting because management accounting is not limited to recording transactions or producing periodic reports. Its practical value lies in supporting planning, forecasting, cost control, variance interpretation, resource allocation, and performance evaluation under conditions of uncertainty and interdependence.

Compared with earlier generations of automation, GenAI offers capabilities that are particularly salient for managerial decision-making. It can summarize large volumes of structured and unstructured information, generate explanations in natural language, compare scenarios, and reduce the cognitive costs of engaging with complex data environments [3], [4]. In principle, these capabilities could strengthen how managers use accounting-relevant information in budgeting, procurement, scheduling, quality-cost trade-offs, and cross-functional review. At the same time, the literature also warns that AI-enabled analysis may produce opacity, overconfidence, weak accountability, and governance failures if persuasive outputs are treated as reliable without adequate validation [5]. GenAI therefore should not be understood as a simple technical upgrade. Its implications are organizational, interpretive, and institutional as well as computational.

This issue becomes particularly important in manufacturing firms. In manufacturing, management accounting is closely entangled with production execution, supply-chain coordination, project planning, quality management, engineering constraints, and after-sales service. Accounting information becomes useful only when it can be connected to operational realities rather than treated as an isolated financial subsystem. Manufacturing firms therefore offer a valuable setting for examining whether GenAI can improve the quality of management accounting decisions by expanding relevant information, strengthening interpretation, and supporting coordination between finance and operating functions.

[Received 11 February 2026; Accepted 14 April 2026; Published (online) 20, April, 2026]

Despite the rapid growth of AI-related accounting research, important empirical gaps remain. Existing work has concentrated mainly on conceptual discussion, literature reviews, disclosure quality, audit outcomes, and ethical concerns [2], [5]-[7]. There is still relatively little firm-level evidence showing how GenAI shapes management accounting decisions in practice. This gap is especially visible in the literature on Chinese manufacturing firms, even though China is one of the most significant contexts for digital manufacturing transformation. Large Chinese manufacturers increasingly combine industrial internet systems, digital supply chains, shared-finance centers, and visible AI deployment. They therefore provide a useful setting for developing more grounded explanations of AI-enabled management accounting.

To address this gap, this paper examines three Chinese manufacturing firms: Midea Group, Haier Smart Home, and Dongfang Electric. Midea publicly states that it will actively embrace generative AI and reconstruct its traditional value chain through digital and AI technologies [8]. It has also disclosed that its Thailand air-conditioner lighthouse factory deployed 72 digital and AI solutions, including generative AI, to improve supply-chain resilience, quality feedback, and workforce capability [9]. Haier Smart Home's 2024 annual report states that it integrated Google Cloud's generative AI platform, Vertex AI, into SmartHQ, while later official communications indicate that the company would expand AI applications across operations [10], [11]. Dongfang Electric's 2024 annual report states that it is promoting pilot projects for scenario-based AI applications and advancing intelligence reform and digital transformation [12]. Official group materials further show that Dongfang Electric has built a smart shared-finance platform integrated with business systems and is promoting business-finance integration through intelligent scenario applications [13]. These firms provide useful variation in AI visibility, operational context, and digital-financial maturity.

The research question is: How, and under what conditions, might generative AI influence the quality of management accounting decisions in manufacturing firms? The wording of this question is intentional. Because the evidence base is documentary rather than ethnographic or interview-based, the paper does not claim to directly observe internal decision processes. Instead, it seeks to identify plausible mechanisms and carefully bounded inferences from public evidence. Following the logic of theory-building from multiple cases, the goal is analytical explanation rather than statistical generalization [14], [15].

This paper contributes in four ways. First, it sharpens the concept of management accounting decision quality and distinguishes it from adjacent ideas such as information quality, decision support capability, and digital management effectiveness. Second, it clarifies what counts as GenAI in a case-based empirical setting and differentiates explicit generative applications from broader AI-enabled or digital-transformation capabilities. Third, it strengthens the research design by making the coding logic, triangulation process, and inference criteria explicit. Fourth, it develops a cautious process framework showing that GenAI's potential effect on management accounting decision quality is mediated by information enrichment and analytical augmentation, but conditioned by organizational embedding and evidentiary visibility.

2. Literature Review and Conceptual Clarification

2.1 Generative AI and Management Accounting

Recent scholarship indicates that AI is transforming management accounting beyond routine automation. Abbas argues that AI changes the informational and organizational basis of management accounting, affects value creation, and alters the role of management accountants [2]. Professional reporting similarly suggests that AI in accounting is moving toward broader augmentation of analysis and advisory work rather than merely reducing manual effort [1]. This is important because management accounting is fundamentally concerned with decision support, interpretation, and organizational coordination, not simply with data processing.

GenAI adds a qualitatively different capability set to this trajectory. Unlike traditional rule-based systems that depend mainly on structured inputs and predefined workflows, GenAI can interpret text, summarize complexity, produce conversational explanations, and generate alternative scenarios in natural language [3], [4]. These features may be especially useful in management accounting contexts where decision makers must connect financial and non-financial information under time pressure. In planning and budgeting, for example, the practical challenge is often not a lack of data but a lack of integrative interpretation.

At the same time, the literature cautions against deterministic assumptions. Lehner et al. show that AI-based decision-making in accounting and auditing raises concerns about transparency, accountability, trustworthiness, and ethical control [5]. These concerns are particularly relevant for GenAI because fluent outputs can appear convincing even when the underlying reasoning is incomplete or weakly grounded. Accordingly, the value of GenAI for management accounting cannot be understood solely in technical terms. It must also be evaluated in relation to organizational processes, governance routines, and the credibility of the information environment in which it operates.

2.2 Defining Management Accounting Decision Quality

A central concept in this paper is management accounting decision quality. In this study, the term refers to the extent to which accounting-supported managerial judgments are based on information and analysis that are timely, decision-relevant, sufficiently accurate for the task at hand, internally coherent across functions, intelligible to decision makers, and usable for coordinated organizational action. This definition is intentionally narrower than "digital effectiveness" and broader than "information accuracy" alone.

The distinction from adjacent concepts matters. First, management accounting decision quality is not identical to information quality. Information quality concerns the properties of data or reports, such as accuracy, completeness, readability, or timeliness. Decision quality, by contrast, refers to whether accounting-supported judgments are meaningfully improved in concrete managerial contexts. Better data may contribute to better decisions, but the two are not

the same. Second, management accounting decision quality is not identical to decision support capability. A system may offer powerful support tools yet still fail to improve decisions if outputs are poorly integrated into routines or are not trusted by managers. Third, the concept is narrower than digital management effectiveness, which refers to broad organizational performance improvements associated with digital transformation. Management accounting decision quality focuses specifically on accounting-supported judgments in activities such as budgeting, forecasting, cost control, procurement review, quality-cost analysis, and performance evaluation.

In manufacturing firms, this concept can be observed indirectly through documentary traces such as claims about improved forecast responsiveness, tighter linkage between finance and operations, faster interpretation of cost deviations, better coordination in procurement and inventory planning, or more effective quality and service feedback loops. Because the present study relies on public documents rather than internal observation, these indicators are treated as inferential signals rather than direct measures. This narrower and more explicit definition helps prevent the concept from becoming so expansive that it absorbs any positive outcome associated with AI or digitalization.

2.3 Distinguishing GenAI from Broader AI and Digital Transformation

A second conceptual clarification concerns the meaning of GenAI. In this paper, GenAI refers to AI systems or application layers that can generate content-like outputs - such as text summaries, explanations, conversational answers, scenario narratives, or synthesized interpretations - rather than merely classify, predict, optimize, or automate within fixed rules. This definition helps differentiate explicit generative functionality from broader AI-enabled analytics or general digital-transformation initiatives.

This distinction is necessary because the three cases differ in the visibility of explicit generative applications. Midea and Haier provide comparatively direct public references to generative AI [8]-[11]. In Dongfang Electric, by contrast, the public evidence more clearly documents scenario-based AI applications, shared-finance systems, and business-finance integration than a fully explicit GenAI label [12], [13]. For that reason, the Dongfang Electric case is treated more cautiously. It is used primarily to illuminate organizational embedding and AI-adjacent decision infrastructures rather than to claim a fully observed GenAI deployment of the same visibility as in Midea or Haier.

Methodologically, this means the paper studies GenAI-related decision effects across a spectrum of visibility. At one end are explicit generative applications; at the other are AI-enabled organizational architectures that plausibly support generative-style interpretation and scenario use, but are documented publicly in more general terms. This approach preserves empirical realism. It also prevents the paper from overstating the uniformity of GenAI across the cases.

2.4 Analytical Framework

Based on the literature and the initial reading of the case materials, the paper develops an analytical framework built around three linked mechanisms.

The first mechanism is information enrichment. GenAI-related capabilities can broaden the usable informational perimeter of management accounting by synthesizing structured and unstructured data, including production records, quality feedback, logistics data, procurement information, service interactions, and downstream user signals. The expected implication is not simply "more data" but more decision-relevant visibility.

The second mechanism is analytical augmentation. GenAI can summarize exceptions, generate explanations, compare scenarios, and translate technically complex information into more intelligible managerial language. The expected implication is not the elimination of managerial discretion, but a reduction in interpretive friction between data and judgment.

The third mechanism is organizational embedding. The preceding two mechanisms are unlikely to improve management accounting decisions unless AI outputs are embedded in standardized processes, integrated business-finance systems, and routines of human review, accountability, and cross-functional coordination. Without embedding, richer data and more fluent outputs may create noise, ambiguity, or overconfidence rather than better decisions.

The analytical claim of the paper is therefore conditional rather than deterministic: public documentary evidence suggests that GenAI may contribute to management accounting decision quality indirectly through information enrichment and analytical augmentation, but only when these capabilities are organizationally embedded and institutionally disciplined.

3. Research Design

This study adopts a qualitative multiple-case design. A case approach is appropriate because the research question is explanatory and process-oriented: the study seeks to understand how GenAI-related capabilities may influence management accounting decision quality and under what organizational conditions. Case research is especially useful when the phenomenon is emergent, organizationally embedded, and difficult to observe through purely variable-based designs [14], [15].

A multiple-case design was chosen over a single-case design for two reasons. First, cross-case comparison enables pattern replication and contrast, which strengthens analytical inference. Second, the three firms offer theoretically useful variation while sharing the broad condition of being major Chinese manufacturers with active digital-transformation agendas. The aim is therefore not statistical representativeness, but analytical generalization.

The cases were selected through theoretical sampling using four criteria. First, the company had to be a major Chinese manufacturing firm. Second, it had to disclose AI or GenAI-related initiatives in public materials. Third, the available evidence had to bear directly on management-accounting contexts such as planning, budgeting, quality management, procurement, shared finance, or business-finance integration. Fourth, the public documentation had to be sufficiently substantive to permit a structured case reconstruction.

The evidentiary base consists primarily of official public documents released in 2024 and 2025. For Midea, the core materials are the 2024 semi-annual report and the company's 2025 lighthouse-factory disclosure [8], [9]. For Haier Smart Home, the key materials are the 2024 annual report and the company's 2025 official AI-roadmap communication [10], [11]. For Dongfang Electric, the principal sources are the 2024 annual report and official group materials on digital intelligence, smart finance, and business-finance integration [12], [13]. Recent academic and professional literature was used to inform conceptual framing [1]-[7].

The documentary nature of the evidence creates both value and limits. On the one hand, official disclosures are consequential organizational texts: they reveal what firms publicly claim, how they frame AI adoption, and which operational and financial linkages they choose to emphasize. On the other hand, such sources do not provide direct access to internal meeting dynamics, informal decision practices, contested implementation problems, or counterfactual outcomes. Accordingly, the study treats public claims as evidentiary signals requiring careful interpretation rather than as straightforward proof of causal impact.

3.1 Coding Procedure, Triangulation, and Inference Logic

To enhance analytical transparency, the study employed a structured four-stage coding and inference procedure. Initially, a provisional coding frame was deductively developed from the literature and research questions, where first-order codes capturing aspects like GenAI visibility and process standardization were grouped into second-order categories representing the core mechanisms of information enrichment, analytical augmentation, organizational embedding, and boundary conditions. Subsequently, within-case coding was conducted individually per firm to preserve case integrity, with each coded claim linked to documentary evidence and assigned an evidentiary status based on the clarity of AI references. Third, limited systematic triangulation was applied, relying on consistency checks across a firm's public documents, alignment with conceptual literature, and coherence between AI initiatives and linked operational or financial domains, thereby strengthening claims supported by multiple sources. Finally, cross-case inferences were drawn only when patterns emerged across at least two cases with documentary support for the underlying mechanism, leading to cautiously phrased conclusions using terms like "suggests" or "indicates" to align findings with the evidentiary limits of the public data.

Table 1. Case selection and evidence base

Case firm	Manufacturing context	Public GenAI / AI signal	Management-accounting relevance	Main evidence used
Midea Group	Consumer appliances, industrial technology, robotics	Explicit commitment to generative AI; lighthouse factory using 72 digital/AI solutions including generative AI	Cost control, scheduling, workforce capability, supply-chain response, working capital	2024 semi-annual report; 2025 lighthouse-factory disclosure
Haier Smart Home	Smart-home manufacturing and ecosystem platform	Vertex AI integration into SmartHQ; AI-driven roadmap and consumer insights	Planning, product mix, quality control, lifecycle management, service-cost implications	2024 annual report; 2025 official AI roadmap
Dongfang Electric	Heavy equipment and project-based manufacturing	Scenario-based AI pilots; intelligent transformation; smart shared finance	Budget visibility, procurement coordination, cost allocation, management cockpit, business-finance integration	2024 annual report; official group digital-intelligence article

Table 2. Coding and inference rules

Analytical element	Coding focus	Evidentiary threshold	Example interpretation rule
Information enrichment	References to broader usable data (operations, quality, service, logistics, user signals)	Stronger when linked to a concrete process domain rather than a general digital claim	Treat as relevant only when the disclosure implies accounting-supported planning or control consequences
Analytical augmentation	References to explanation, scenario support, interpretation, summarization, or decision guidance	Stronger when AI is linked to managerial analysis rather than only automation	Avoid claiming improved decisions unless interpretive support is visible in the disclosure

Analytical element	Coding focus	Evidentiary threshold	Example interpretation rule
Organizational embedding	References to shared finance, ERP integration, process routines, cross-functional coordination, governance	Stronger when embedded in standardized workflows or business-finance architecture	Treat as a conditioning mechanism, not as evidence of GenAI by itself
Boundary conditions	References to data maturity, governance, trust, process integration, or ambiguity of AI visibility	Stronger when limitations or enabling conditions are documentable	Use cautionary language where only indirect evidence exists

4. Within-Case Analysis

4.1 Midea Group

Midea provides the clearest case of visible GenAI-related deployment in a large-scale manufacturing context. The company publicly states that it will actively embrace generative AI and reconstruct its traditional value chain through digital and AI technologies [8]. This is analytically significant because it positions generative capability not as a peripheral experiment, but as part of broader enterprise transformation. For management accounting, that framing matters because it implies a broader flow of potentially decision-relevant information across production, supply chain, service, workforce development, and planning.

The strongest public evidence comes from Midea's Thailand air-conditioner lighthouse factory. According to the company's official disclosure, the factory deployed 72 digital and AI solutions to address inflexible cross-border supply chains, slow response to customer quality feedback, and workforce-training barriers [9]. The firm reports improvements in end-to-end order lead time and employee certification time, while also describing the use of generative AI for workforce capability enhancement [9]. These are operational outcomes rather than direct accounting metrics. Even so, they are relevant to management accounting because shorter lead times, faster capability building, and stronger quality feedback loops can plausibly affect budgeting assumptions, capacity planning, labor-cost visibility, working-capital judgments, and variance interpretation.

Within the analytical framework of this paper, Midea most clearly illustrates information enrichment. The public materials suggest that AI-enabled systems are making production, quality, logistics, and workforce signals more visible and more usable in managerial planning and control. The case also offers evidence of analytical augmentation, although this evidence is more indirect. Midea's descriptions of quality intelligence, intelligent scheduling, and feedback-loop closure imply that data are being converted into a more interpretable operational picture rather than remaining fragmented technical inputs.

The Midea case further suggests relatively strong organizational embedding. The reported gains are credible not because public disclosures prove an internal decision effect directly, but because the AI initiatives are described as operating inside an already mature digital manufacturing environment rather than as isolated pilots. In interpretive terms, Midea indicates that GenAI is most likely to matter for management accounting when it sits within routinized production and supply-chain systems and improves the informational conditions under which finance and operations make joint judgments.

4.2 Haier Smart Home

Haier Smart Home presents a different configuration. Whereas Midea's public GenAI narrative is closely tied to manufacturing execution and value-chain reconstruction, Haier's is more ecosystem-oriented. The company's 2024 annual report states that it integrated Google Cloud's generative AI platform, Vertex AI, into SmartHQ, and later official communications indicate that AI-driven consumer insights are informing planning, research, quality control, and user-facing innovation [10], [11]. This makes Haier especially useful for examining whether GenAI may strengthen management accounting not only through internal manufacturing data, but also through product, service, and downstream user information.

The central implication of Haier's case is that the informational perimeter of management accounting may expand beyond conventional production and sales data. Product usage, service interactions, platform intelligence, and downstream customer behavior may all become relevant inputs to planning, product-mix decisions, warranty provisioning, service-cost estimation, and lifecycle profitability analysis. The documentary evidence does not allow direct observation of how managers weigh these signals in actual decision meetings. However, it does provide a plausible basis for inferring that AI-enabled ecosystem intelligence can widen the informational basis on which accounting-supported judgments are made.

Haier is also strong on analytical augmentation. The combination of generative AI infrastructure, platform connectivity, and AI-driven consumer insights suggests a setting in which heterogeneous information can be translated into more intelligible managerial guidance [10], [11]. This matters because many management-accounting problems are interpretive before they are computational. Managers may already possess abundant operational and customer data but still struggle to convert them into coordinated planning and control decisions.

At the same time, Haier highlights an important governance tension. The wider the informational perimeter, the greater the need for disciplined translation into business-finance routines. Consumer-facing intelligence does not automatically

become management-accounting value. The case therefore supports a more critical reading of GenAI: its usefulness depends not simply on richer ecosystem data, but on whether those data can be rendered credible, comparable, and organizationally actionable in planning and control contexts.

4.3 Dongfang Electric

Dongfang Electric represents a third and more cautious pathway. Compared with Midea and Haier, its public use of the term "generative AI" is less visible. However, its 2024 annual report states that the company is promoting pilot projects for scenario-based AI applications and advancing intelligence reform and digital transformation [12]. Official group materials further indicate that Dongfang Electric has built a smart shared-finance platform integrated horizontally with ERP and other business systems and is promoting business-finance integration through budget linkage, procurement-finance coordination, manufacturing-cost allocation optimization, management cockpits, and intelligent scenario applications [13].

This makes Dongfang Electric highly relevant to the organizational embedding mechanism. In project-based heavy-equipment manufacturing, management accounting decisions often involve long cycles, large procurement commitments, complex cost structures, and significant coordination requirements. In such a setting, AI is unlikely to improve decision quality merely by producing more information. Its value depends on whether that information can be absorbed into integrated business-finance routines and made credible for managerial action.

For this reason, Dongfang Electric is analytically useful even though it offers weaker explicit GenAI visibility than the other two cases. The case suggests that the infrastructural side of AI-enabled management accounting may be just as important as visible generative applications. Shared finance, process integration, management cockpits, and intelligent scenario tools do not by themselves prove a generative mechanism. What they do suggest is that the organizational preconditions for GenAI-like interpretation and scenario support may be maturing. The case therefore reinforces a key argument of this paper: where public evidence of explicit GenAI is limited, the most defensible inference concerns organizational readiness and embedding rather than direct claims of transformed management accounting decisions.

5. Cross-Case Findings

Across the three cases, GenAI does not primarily appear as a substitute for managerial judgment. Rather, the documentary evidence suggests that it functions as an enabling interpretive layer that can change the informational inputs, analytical form, and coordination conditions of management accounting decisions. Four cross-case findings stand out.

5.1 Information Enrichment

All three firms show some degree of information enrichment, although in different ways. In Midea, GenAI-related applications appear to make shop-floor, quality, logistics, and workforce data more visible and more decision-relevant [8], [9]. In Haier, AI appears to widen the information set further by incorporating product, service, and downstream user signals [10], [11]. In Dongfang Electric, shared-finance and business-finance integration appear to improve the combinability of business and financial information [12], [13].

This finding matters because it suggests that GenAI's relevance to management accounting does not lie in improving financial data in isolation. Instead, its potential value lies in making more kinds of relevant information usable in accounting-supported judgment. Public disclosures cannot show exactly how managers weighted these inputs internally. Even so, across the cases, GenAI-related capabilities appear to broaden the informational base from which planning, control, and evaluation may be conducted.

5.2 Analytical Augmentation

The cases also indicate analytical augmentation. In Midea, the quality-intelligence and scheduling context suggests faster interpretation of manufacturing conditions [9]. In Haier, platform-linked AI and consumer insight systems suggest stronger support for scenario reasoning across product, service, and lifecycle decisions [10], [11]. In Dongfang Electric, AI scenario pilots and management cockpits suggest an interpretive layer built on top of integrated financial and operational systems [12], [13].

The analytical importance of this pattern is that many organizations do not primarily suffer from data scarcity; they suffer from interpretive fragmentation. GenAI may reduce that gap by summarizing anomalies, linking operational events to financial implications, and presenting complex information in more intelligible forms. Here again, the public evidence permits only cautious inference. The cases suggest the possibility of better managerial reasoning conditions, not direct proof of better judgment in every instance.

5.3 Organizational Embedding

The strongest cross-case finding concerns organizational embedding. Midea's reported outcomes are plausible because the AI applications are tied to concrete operational workflows [9]. Haier's AI roadmap matters because it is linked to integrated planning, innovation, and service processes rather than standing alone as a consumer-facing feature [11]. Dongfang Electric is strongest on this dimension because shared-finance and business-finance integration provide a disciplined environment in which AI-supported analysis can plausibly be translated into managerial action [13].

This pattern suggests that GenAI improves management accounting decision quality, if at all, through organized routines rather than through isolated technical capability. Management accounting rarely creates value in a vacuum. It becomes consequential when finance, operations, procurement, quality, and senior management can act on a shared informational basis. Organizational embedding therefore functions as both a conditioning mechanism and a credibility filter.

5.4 Boundary Conditions and Evidentiary Cautions

The cross-case comparison also reveals important boundary conditions. Data maturity matters because AI creates more value when firms already possess integrated and trustworthy information infrastructures. Task structure matters because

GenAI is especially relevant where managers must combine heterogeneous signals under uncertainty rather than execute fully routine calculations. Governance matters because persuasive outputs do not automatically become reliable decision inputs. Functional trust matters because even analytically rich outputs may be ignored if finance and operating units do not share interpretive confidence.

Just as importantly, evidentiary caution matters. The present study cannot directly verify internal decision conversations, failed pilots, resistance, or counterfactual outcomes. Its most defensible contribution is therefore not a definitive causal claim that GenAI improves management accounting decision quality, but a process model indicating how such improvement may occur under visible organizational conditions. This more cautious formulation better matches the documentary basis of the evidence.

Table 3. Cross-case comparison of mechanisms and likely implications

Dimension	Midea Group	Haier Smart Home	Dongfang Electric
Dominant AI context	Smart manufacturing and supply-chain execution	Smart-home ecosystem, user intelligence, lifecycle data	Shared finance, business-finance integration, scenario pilots
Strongest visible mechanism	Information enrichment in operations	Analytical augmentation across ecosystem intelligence	Organizational embedding and process discipline
Main accounting relevance	Forecasting, cost control, scheduling, working capital	Planning, product mix, quality control, service-cost implications	Budget visibility, procurement coordination, cost allocation, risk control
Most defensible inference	Richer operational-financial visibility	Broader and more interpretable cross-domain insight	Stronger organizational conditions for disciplined AI-supported analysis
Primary caution	Public evidence still indirect on internal decisions	Need to translate ecosystem data into finance routines	Explicit GenAI visibility is weaker than in the other cases

6. Discussion

The revised findings contribute to the AI-and-accounting literature in a more theoretically disciplined way. Existing studies have shown that AI can improve disclosure quality, reduce information asymmetry, and affect accounting efficiency [2], [6], [7]. The present study extends that literature by focusing specifically on management accounting decision quality and by specifying a conditional process model rather than a linear performance claim. The evidence suggests that the relevant sequence is not simply "AI adoption -> better decisions." Instead, the process appears to involve information enrichment, analytical augmentation, and organizational embedding, with each stage shaping whether accounting-supported managerial judgment is likely to improve.

This process view also reinforces a broader understanding of management accounting as a boundary-spanning organizational function rather than a closed financial subsystem. Across the cases, the quality of accounting-supported judgments depended on how financial data could be linked to manufacturing conditions, quality signals, supply-chain dynamics, service interactions, and user-side information. GenAI appears potentially valuable because it can help translate across these domains. In that sense, the contribution of GenAI is not just computational acceleration, but a possible reduction in interpretive distance between finance and operations.

At the same time, the study strengthens the critical side of the debate. The cases do not support a deterministic or celebratory account of AI in management accounting. Public disclosures are often oriented toward strategic signaling and may overemphasize success while underreporting implementation frictions. Moreover, persuasive AI outputs may create a false sense of analytical certainty if governance routines, human review, and accountability structures are weak [5]. The practical and theoretical implication is that governance is not an external constraint placed on AI after adoption; it is a constitutive condition of whether AI-supported analysis becomes managerially useful at all.

The Chinese manufacturing context adds another layer of significance. The cases suggest that digital transformation in large Chinese manufacturers is moving beyond basic informatization toward a more integrated architecture in which industrial internet systems, shared finance, and AI-enabled interpretation increasingly intersect. Yet the cases also show that pathways differ. Midea highlights value-chain reconstruction and manufacturing visibility. Haier highlights ecosystem intelligence and downstream user signals. Dongfang Electric highlights the infrastructural conditions of business-finance integration and shared finance. These variations indicate that AI-enabled management accounting should be analyzed as a family of organizational trajectories rather than as one homogeneous adoption pattern.

6.1 Practical Implications

Several practical implications follow. First, firms should avoid treating GenAI as a stand-alone technology initiative. The more consequential question is whether it improves the quality of specific decision routines such as rolling forecasts, procurement planning, variance reviews, quality-cost trade-offs, and cross-functional performance discussions. Second, firms should prioritize data and process readiness before expecting meaningful decision gains. The Dongfang Electric case especially suggests that AI is more likely to add value when built on top of integrated shared-finance and business-

process architectures [13]. Third, management accountants may need to reposition themselves less as report preparers and more as interpreters, coordinators, validators, and governance actors. Finally, firms should build explicit review routines around AI-supported analysis so that fluent outputs are tested against operational knowledge and accountability requirements rather than accepted at face value.

6.2 Limitations and Future Research

This study has three main limitations. First, it relies primarily on public documentary evidence, so its conclusions about internal management accounting decision processes remain interpretive rather than directly observed. Second, the case set is small and theoretically sampled, which supports analytical generalization but not statistical generalization [14], [15]. Third, the visibility of explicit GenAI differs across the cases, which means that not all mechanisms are equally evidenced in each firm.

These limitations point to a clear future research agenda. Follow-up studies could use interviews, internal archival materials, survey evidence, or longitudinal observation to verify how managers actually use AI-supported information in budgeting, forecasting, cost control, or investment evaluation. Quantitative studies could test specific dimensions of management accounting decision quality instead of treating the concept holistically. Comparative work could also examine whether the mechanisms identified here differ across industries, ownership structures, or levels of digital maturity.

7. Conclusion

This paper examined how generative AI may influence the quality of management accounting decisions through an interpretive multiple-case study of Midea Group, Haier Smart Home, and Dongfang Electric. The revised analysis makes a deliberately cautious claim. The public documentary evidence does not demonstrate that GenAI directly improves management accounting decisions in a fully observable causal sense. What it does show is a plausible and analytically consistent pattern: GenAI-related capabilities may improve the conditions of accounting-supported judgment by broadening the usable information base, augmenting interpretation, and strengthening coordination when embedded in disciplined organizational routines.

The paper therefore argues that GenAI's significance for management accounting lies less in replacing managerial judgment than in reshaping the informational and organizational conditions under which that judgment is exercised. At the same time, the study emphasizes that these effects are conditional, uneven, and dependent on data maturity, process integration, governance discipline, and evidentiary visibility. By sharpening the core concepts, clarifying the empirical boundaries, and strengthening the research design, the paper offers a more credible and theoretically grounded account of how GenAI may matter for management accounting in manufacturing firms.

References

[1] CPA.com, 2025 AI in Accounting Report. New York, NY, USA: CPA.com, 2025.

[2] K. Abbas, "Management accounting and artificial intelligence: A comprehensive literature review and recommendations for future research," The British Accounting Review, 2025, Art. no. 101551, doi: 10.1016/j.bar.2025.101551.

[3] D. K. C. Lee, C. Guan, Y. Yu, and Q. Ding, "A comprehensive review of generative AI in finance," FinTech, vol. 3, no. 3, pp. 460-478, 2024, doi: 10.3390/fintech3030025.

[4] D. Schlegel and R. Fink, "Generative artificial intelligence in business planning and financial budgeting," in Herman Hollerith Conference 2024, Wiesbaden, Germany: Springer Vieweg, 2025, pp. 42-51, doi: 10.1007/978-3-658-48215-2_6.

[5] O. M. Lehner, K. Ittonen, H. Silvola, E. Strom, and A. Wuhrleitner, "Artificial intelligence based decision-making in accounting and auditing: Ethical challenges and normative thinking," Accounting, Auditing & Accountability Journal, vol. 35, no. 9, pp. 109-135, 2022, doi: 10.1108/AAAJ-09-2020-4934.

[6] J. Li, "Artificial intelligence innovation and financial report quality," International Review of Economics & Finance, vol. 105, Art. no. 104832, 2026, doi: 10.1016/j.iref.2025.104832.

[7] J. Lai, "Artificial intelligence applications and audit fees: An empirical study," International Review of Economics & Finance, vol. 103, Art. no. 104421, 2025, doi: 10.1016/j.iref.2025.104421.

[8] Midea Group Co., Ltd., Semi-Annual Report 2024. Foshan, China: Midea Group Co., Ltd., 2024.

[9] Midea Group, "Midea establishes first overseas air conditioner lighthouse factory as a benchmark for supply chain going global," Sep. 16, 2025.

[10] Haier Smart Home Co., Ltd., Annual Report 2024. Qingdao, China: Haier Smart Home Co., Ltd., 2025.

[11] Haier Group, "Haier Smart Home unveils AI-driven global innovation roadmap at 2025 ecosystem conference," Mar. 19, 2025.

[12] Dongfang Electric Corporation Limited, Annual Report 2024. Chengdu, China: Dongfang Electric Corporation Limited, 2025.

[13] Dongfang Electric Group, "Using digital intelligence to enhance core competitiveness in the digital era" [in Chinese], official group article, 2025.

[14] K. M. Eisenhardt, "Building theories from case study research," Academy of Management Review, vol. 14, no. 4, pp. 532-550, 1989.

[15] K. M. Eisenhardt and M. E. Graebner, "Theory building from cases: Opportunities and challenges," Academy of Management Journal, vol. 50, no. 1, pp. 25-32, 2007.