“Digital accounting implementation and perceived operational performance in Vietnamese commercial banks: Empirical evidence from accountants and managers”

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DIGITAL ACCOUNTING IMPLEMENTATION AND PERCEIVED OPERATIONAL PERFORMANCE IN VIETNAMESE COMMERCIAL BANKS: EMPIRICAL EVIDENCE FROM ACCOUNTANTS AND MANAGERS

Abstract

This study examines the relationships among digital accounting implementation, financial reporting quality, usefulness of accounting information, top management support, and perceived operational performance in commercial banks. Data were collected from 562 accountants and managers working at 27 commercial banks in Vietnam, an emerging Asian economy. The study evaluated the proposed model using a two-stage Partial Least Squares Structural Equation Modeling approach. The findings indicate that digital accounting implementation is positively associated with perceived operational performance. In addition, digital accounting implementation is indirectly associated with perceived operational performance through statistically significant indirect paths involving financial reporting quality and usefulness of accounting information. Financial reporting quality is also positively associated with the usefulness of accounting information. Furthermore, the positive associations between digital accounting implementation and both financial reporting quality and usefulness of accounting information were stronger at higher levels of perceived top management support, whereas the interaction between digital accounting implementation and perceived operational performance was not statistically significant. Collectively, the findings suggest that perceptions of digital accounting implementation are closely related to perceptions of information quality, information usefulness, managerial support, and perceived operational performance. This study contributes empirical evidence on the interrelationships among these perceived organizational constructs in the context of banking digital transformation in an emerging economy.

Keywords digital accounting, perceived operational performance, financial reporting quality, usefulness of accounting information, commercial banks, Vietnam

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INTRODUCTION

The rapid advancement of digital technologies has fundamentally transformed the banking industry, reshaping traditional business models and financial management practices. Technologies such as artificial intelligence, big data analytics, cloud computing, and digital platforms have accelerated the digitalization of banking operations and increased the strategic importance of accounting information systems. Within this transformation, digital accounting has become an integral component of banks' information infrastructure because it supports the timely processing, integration, and dissemination of financial information.

As commercial banks continue to expand their digital capabilities, digital accounting is increasingly expected to influence financial man-

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agement, managerial decision-making, and organizational operations. However, the organizational consequences of digital accounting implementation (DAI) remain insufficiently understood. In practice, banks face substantial challenges related to legacy information systems, implementation costs, cybersecurity risks, organizational resistance to change, and differences in technological readiness. These conditions may affect how effectively digital accounting systems are embedded in organizational processes and how their potential benefits are perceived within banks.

This issue is particularly important in emerging economies, where regulatory frameworks, technological infrastructure, and organizational capabilities are still evolving. Commercial banks operating in such environments may experience DAI differently from banks in more mature financial systems. Consequently, there is a need to clarify whether and how digital accounting implementation is associated with perceived operational performance (OP) in commercial banks and to understand the organizational conditions under which this relationship is manifested.

From an organizational perspective, accountants and bank managers are directly involved in producing, managing, interpreting, and using accounting information for operational and strategic decisions. Their perceptions provide an important basis for identifying the organizational implications of digital accounting implementation. The scientific problem addressed in this study therefore concerns the insufficient understanding of the relationship between DAI and OP in commercial banks within the institutional context of an emerging economy.

1. LITERATURE REVIEW

Recent research increasingly documents positive relationships between digital transformation, digital accounting, and operational performance in commercial banks across different countries (Nguyen-Thi-Huong et al., 2023; Rebekah & Afjal, 2025). Banking is particularly affected by technological advances and artificial intelligence, which accelerate digital transformation, innovation, and service-quality improvement.

Digital Accounting Implementation (DAI) refers to the extent to which banks adopt digital technologies to automate, integrate, and optimize accounting and financial processes. Digital accounting increasingly functions as a strategic information system supporting decision-making and operational performance (Granlund, 2011; Ajape & Adelowotan, 2025; He et al., 2025). From the Resource-Based View (RBV), DAI represents a technological capability that can enhance information quality and operational efficiency (Bharadwaj, 2000). This study conceptualizes DAI as a second-order construct comprising six dimensions:

1) automation and technology adoption (ATA), involving AI, RPA, and cloud technologies to improve efficiency and reduce errors (Sampaio & Silva, 2025; Xing, 2024; Silva et al., 2025; Nassani et al., 2023);
2) timeliness and accuracy (TLA), reflecting real-time and reliable financial information (Hakimi et al., 2024; Lutfi, 2023);
3) compliance and cost efficiency (CCE), concerning regulatory compliance and cost reduction (Qatawneh & Al-Okaily, 2024; Kriebel & Debener, 2019; Huy et al., 2024);
4) security and data protection (SDP), concerning protection of financial data and access control (Nhan et al., 2022; Mahdi, 2021);
5) system integration (SIG), reflecting connectivity among accounting and other internal and external systems (Thong, 2017; Nicolaou, 2000); and
6) perceived ease of use (PEU), reflecting user-friendliness and alignment with job requirements (Apsari et al., 2023; Andarwati et al., 2019).

*Perceived Operational Performance (*OP) refers to accountants' and managers' perceptions of how effectively banks achieve financial and non-

financial objectives through resource utilization. In the digital era, OP encompasses not only financial outcomes but also process efficiency, service quality, and innovation capability (Kaplan & Norton, 2005). Consistent with RBV, perceived performance reflects how effectively banks leverage internal and digital capabilities to achieve organizational outcomes (Bharadwaj, 2000). OP is therefore conceptualized as a second-order construct comprising perceived financial performance (PFP) and perceived non-financial performance (PNF). PFP includes revenue growth, profitability (e.g., ROA and NIM), cost efficiency (e.g., CIR), and operational cost control (Tsou & Chen, 2023; Aldhaheri & Ahmad, 2024). PNF covers process efficiency, automation, customer and employee satisfaction, and product and service innovation (Elbashir et al., 2008; Tseng & Lee, 2014; Al-Dmour et al., 2020; Chen et al., 2016).

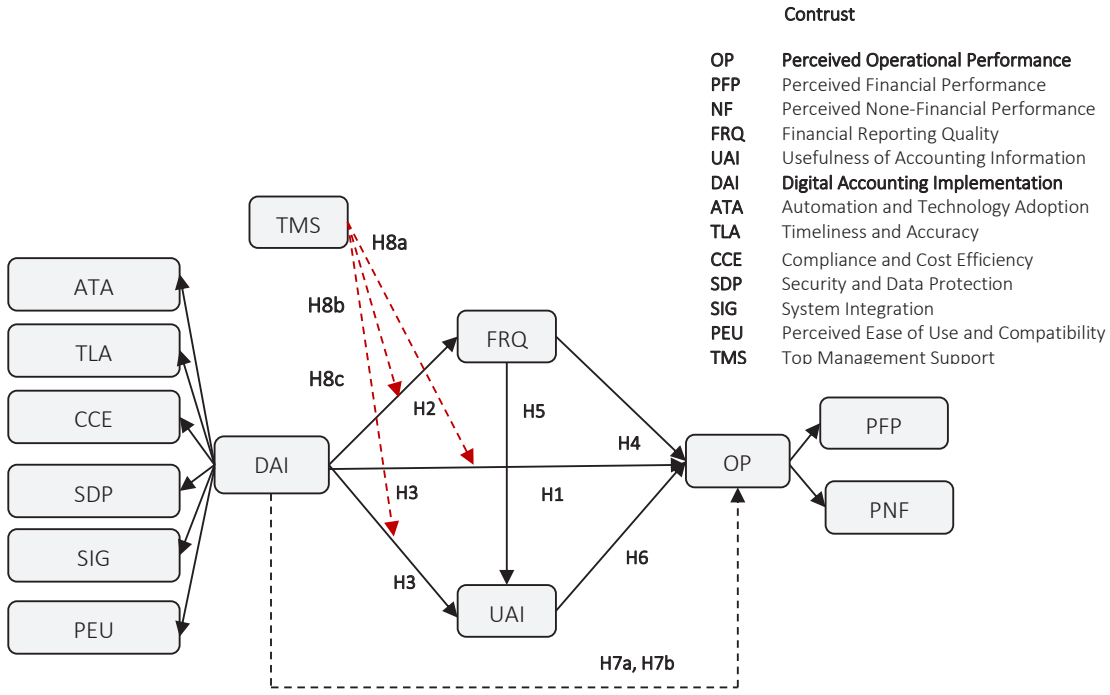
Financial Reporting Quality (FRQ) reflects the extent to which financial information is faithfully represented, reliable, timely, and useful for decision-making. In banking, FRQ supports transparency, reduces information asymmetry, and strengthens governance effectiveness (Bushman & Smith, 2001). From RBV, high-quality financial information constitutes a valuable intangible resource supporting decision-making and performance. Consistent with IASB (2018), FRQ incorporates faithful representation, relevance, verifiability, timeliness, and understandability, which enhance transparency, credibility, and economic decision-making (Divyashree et al., 2024; Dechow et al., 2010). In this study, FRQ encompasses accuracy and faithful representation, neutrality, verifiability and reliability, traceability and transparency, timeliness, and compliance with accounting standards and regulations. FRQ is thus viewed as an output quality of digital accounting systems and a potential mechanism linking DAI to OP.

Usefulness of Accounting Information (UAI) refers to the extent to which accounting information supports managerial and stakeholder decision-making. According to IASB (2018), useful information should possess characteristics such as relevance, comparability, understandability, and timeliness. From RBV, useful accounting information represents a strategic intangible resource that strengthens analytical capability, forecasting, risk management, and decision-making. Clear and balanced information can also reduce information asymmetry and improve transparency (Tran Thanh Thuy, 2025; Saleh & Al-Nimer, 2022). UAI is conceptualized through comparability, feedback and predictive value, understandability, clarity of assumptions and estimates, balance and neutrality, timeliness, and risk-control support (Al-Dmour et al., 2023; Abu Afifa et al., 2025; Abu Afifa & Nguyen, 2023). Thus, UAI represents the practical value of accounting information and a potential mechanism linking DAI with OP.

Top Management Support (TMS) reflects senior management's commitment, strategic orientation, and resource allocation toward technological initiatives. Within the TOE framework, TMS is an important organizational factor in technology adoption and implementation (Thong, 1999), particularly in resource-intensive banking environments. From RBV, TMS represents a strategic managerial resource supporting the development of technological capabilities such as digital accounting through investment, strategic vision, and an innovation-oriented culture (Venkatesh et al., 2003). Prior research also associates TMS with organizational readiness, user acceptance, and resource allocation in information-system implementation.

Overall, the literature recognizes digital technologies as strategic resources associated with operational efficiency, decision-making, and competitiveness. Integrating the TOE framework and RBV provides a basis for explaining the organizational conditions and mechanisms through which digital capabilities may relate to perceived operational performance. However, several gaps remain. First, most studies examine digital transformation broadly, with limited attention to digital accounting as a distinct organizational capability and its relationship with OP in commercial banks. Second, although accounting information quality has been widely studied, the relationships among DAI, FRQ, UAI, and OP remain insufficiently examined. Third, despite the recognized importance of TMS in technology adoption, its role in the organizational outcomes associated with DAI remains underexplored. These gaps are particularly relevant in emerging economies, where

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Note: Direct relationship – black line; Moderating relationship – black dotted line; Mediating relationship – red dotted line.

Figure 1. Proposed research model with hypothesized paths

banking institutions face evolving regulatory environments and heterogeneous levels of technological capability.

Addressing these gaps is important for advancing the literature on digital accounting and banking digitalization. Accordingly, this study aims to investigate the relationships among DAI, FRQ, UAI, TMS, and OP within commercial banks in an emerging market. Based on the theoretical foundations and prior empirical evidence reviewed above, the following hypotheses are proposed:

H1: DAI is positively associated with OP.

H2: DAI is positively associated with FRQ.

H3: DAI is positively associated with UAI.

H4: FRQ is positively associated with OP.

H5: FRQ is positively associated with UAI.

H6: UAI is positively associated with OP.

H7a: FRQ positively mediates the relationship between DAI and OP.

H7b: UAI positively mediates the relationship between DAI and OP.

H8a: TMS positively moderates the relationship between DAI and OP.

H8b: TMS positively moderates the relationship between DAI and FRQ.

H8c: TMS positively moderates the relationship between DAI and UAI.

2. METHODOLOGY

2.1. Measurement scales

As illustrated in Figure 1, DAI is conceptualized as a reflective-formative second-order construct. Specifically, the six first-order dimensions (ATA, TLA, CCE, SDP, SIG, PEU) are each measured reflectively by their respective indicators. These six dimensions are then specified as formative components of the higher-order construct of DAI. Accordingly, the higher-order construct is formed by the combined contribution of its dimensions, and the dimensions are not assumed to be inter-

changeable. Changes in any dimension are expected to alter the overall level of DAI because each dimension captures a distinct aspect of the construct. The measurement scales for the six first-order dimensions were adapted from prior studies, including Sampaio and Silva (2025), Xing (2024), Nassani et al. (2023), Zohry and Al-Dhubaibi (2024), Hakimi et al. (2024), Qatawneh and Al-Okaily (2024), and Andarwati et al. (2019).

In contrast, perceived operational performance is modeled as a reflective–reflective second-order construct comprising two first-order dimensions: PFP and PNP. Both dimensions are measured reflectively and jointly represent manifestations of the higher-order construct of OP. When the overall level of OP changes, both PFP and PNP are expected to vary in the same direction. The measurement scales for OP were adapted from established studies, including Aldhaheri and Ahmad (2024), Tsou and Chen (2023), Elbashir et al. (2008), Chen et al. (2016), and Tseng and Lee (2014).

In addition, FRQ and UAI were included as intervening constructs in the model. FRQ was measured using the scale developed by Divyashree et al. (2024), while UAI was adapted from prior studies by Al-Dmour et al. (2023), Abu Afifa and Nguyen (2023), Ababneh (2021), and Abu Afifa et al. (2025). Finally, TMS is included as a moderating variable, with measurement items derived from Mujalli et al. (2024), Dwivedi et al. (2015) and García-Sánchez et al. (2019).

To ensure content validity and contextual relevance, the initial measurement scales adapted from prior studies were further refined through expert consultation. A total of 15 experts participated in this stage, divided into two groups. The first group comprised eight academic experts holding doctoral degrees and above, with over 15 years of teaching and research experience in accounting, auditing, and finance–banking. The second group included seven senior managers from commercial banks, each with more than 10 years of professional experience and substantial expertise in accounting and digital transformation within the banking sector.

Data were collected through semi-structured interviews combined with focus group discussions, aiming to obtain in-depth insights into the appropriateness and clarity of the proposed constructs and measurement items. Participation was entirely voluntary, and strict confidentiality was maintained, with all data used solely for academic purposes. The outcomes of the expert consultation served as a critical basis for refining, supplementing, and finalizing the measurement scales prior to the quantitative phase. Detailed measurement items are presented in Appendix A.

2.2. Data collection

This study was conducted in Vietnam, an emerging Southeast Asian economy where commercial banks play an important role in financial intermediation and economic development. According to the State Bank of Vietnam, as of December 31, 2025, the banking system comprised 34 commercial banks. The study population was restricted to 27 banks (see Appendix B), excluding seven institutions that were either not publicly listed or subject to compulsory transfer or special supervision. These banks operate under exceptional regulatory and governance arrangements and were therefore excluded to improve population homogeneity and comparability.

Given substantial differences in bank size and operational scale, stratified sampling based on charter capital was employed to ensure representation of small, medium, and large banks. The unit of analysis was the individual respondent, focusing on knowledgeable accountants and managers who evaluated bank-level characteristics. Although DAI, FRQ, UAI, TMS, and OP represent organizational phenomena, they were measured through respondents' perceptions because objective bank-level data on digital accounting implementation are confidential and inaccessible.

The dataset comprised 562 individual responses from 27 banks, with 12-42 respondents per bank. We acknowledge that observations within the same bank may not be statistically independent. Because the institutional sample (N = 27) was insufficient for adequately powered complex PLS-SEM involving mediation and moderation, data were not aggregated to the bank level. Accordingly, the results are interpreted as associations among perceived organizational constructs at the indi-

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Table 1. Descriptive statistics about the samples

Profile	Category	Frequency (N = 562)	Percentage (%)
Sex	Male	260	46.3
	Female	302	53.7
Job Tenure (Years)	Under 5 years	213	37.9
	From 5 to under 10 years	210	37.4
	Over 10 years	139	24.7
Degree Status	Bachelor/Engineer or equivalent	394	70.1
	Postgraduate	168	29.9
Level Position	Employee	384	68.3
	Manager	178	31.7

vidual level rather than objective bank-level causal effects. The potential nested-data dependency is acknowledged as a limitation, and future research should consider multilevel SEM or formal within-bank agreement statistics (e.g., rwg, ICC(1), and ICC(2)) when a larger bank-level sample is available.

At the respondent level, convenience sampling was used because access to banking personnel is constrained by confidentiality and internal administrative procedures. Eligible respondents were identified and invited through participating banks' human resources departments. Data were collected using both printed questionnaires administered during branch visits and online questionnaires distributed internally by HR departments, covering Northern, Central, and Southern Vietnam. All constructs were measured using established scales adapted to the Vietnamese banking context and refined through expert consultation, using a five-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree").

Data collection took place from August 2025 to February 2026. Of 650 questionnaires distributed across the 27 banks, 571 were returned (87.8% response rate). After screening, nine incomplete or inconsistent responses were removed, leaving 562 valid observations. The distribution of respondents across banks is reported in Appendix B, and respondent demographics are presented in Table 1.

2.3. Data analysis

Based on the literature review, the research hypotheses were developed and incorporated into the proposed model. Given the cross-sectional design and simultaneous self-reported measurements, the findings should be interpreted as statistical associations rather than causal relationships. The study employs a complex PLS-SEM approach combining reflective and formative measurement models, which is appropriate for prediction-oriented research and complex models involving multiple latent variables, mediators, and observed indicators (Henseler et al., 2015).

Specifically, DAI is modeled as a higher-order construct comprising six first-order dimensions (ATA, TLA, CCE, SDP, SIG, and PEU), while OP comprises two first-order dimensions (PFP and PNF). The structural model examines relationships among DAI, FRQ, UAI, and OP, incorporating two mediators and one moderator (TMS).

Accordingly, the analysis is conducted in two stages: (1) Stage 1 estimates the second-order PLS-SEM model using the repeated-indicators approach for DAI and OP; and (2) Stage 2 estimates the first-order model after establishing the formative indicators of the higher-order constructs. The PLS-SEM assessment follows a two-step procedure involving evaluation of the measurement and structural models (Henseler & Chin, 2010).

3. RESULTS

3.1. Common method bias assessment

Because the study relies on a cross-sectional survey in which the focal constructs were measured using the same questionnaire, the potential for common method bias (CMB) was considered. Both procedural and statistical approaches were used to assess this potential source of bias.

Table 2. Results of the CMB assessment using the full collinearity test

Relationships	VIF	Relationships	VIF
ATA → Random Dummy	1.919	SDP → Random Dummy	1.939
CCE → Random Dummy	2.059	SIG → Random Dummy	1.885
FFP → Random Dummy	1.980	TLA → Random Dummy	2.073
FRQ → Random Dummy	1.811	TMS → Random Dummy	1.150
FNF → Random Dummy	1.984	UAI → Random Dummy	2.086
PEU → Random Dummy	1.817		

First, Harman's single-factor test was conducted using an unrotated exploratory factor analysis in SPSS 20. The first factor accounted for 30.272% of the total variance, which is below the commonly used 50% benchmark (Podsakoff et al., 2003). This result provides no indication that a single factor dominates the covariance structure of the measurement items.

Second, full-collinearity diagnostics were examined using the variance inflation factor (VIF) approach proposed by Kock (2015). The VIF values reported in Table 2 ranged from 1.150 to 2.086, remaining below the 3.3 threshold commonly used in this diagnostic. These results do not indicate an obvious severe collinearity pattern that would suggest substantial common method variance.

3.2. Measurement model assessment

Following the guidelines of Hair et al. (2019), the measurement model was evaluated using SmartPLS 4 to assess the reliability and validity of the latent constructs through a two-stage approach. In Stage 1, all first-order constructs (ATA, TLA, CCE, SDP, SIG, PEU, PFP, PNF, FRQ, UAI, and TMS) are reflectively specified.

As reported in Table 3, the outer loadings of the indicators for these reflective constructs range

Table 3. Descriptive statistics, internal reliability and convergent reliability

Constructs	Items	Stage 1 (Level 2)					Stage 2 (Level 1)		
		Outer Loading	Mean	CA	C.R	AVE	CA	C.R	AVE
Automation and Technology Adoption (ATA)	ATA1	0.811	3.448	0.876	0.876	0.668			
	ATA2	0.825	3.493						
	ATA3	0.811	3.495						
	ATA4	0.814	3.443						
	ATA5	0.826	3.493						
Timeliness and Accuracy (TLA)	TLA1	0.819	3.491	0.832	0.839	0.664			
	TLA2	0.816	3.534						
	TLA3	0.818	3.459						
	TLA4	0.809	3.457						
Compliance and Cost Efficiency (CCE)	CCE1	0.891	3.480	0.859	0.861	0.780			
	CCE2	0.884	3.539						
	CCE3	0.874	3.504						
Security and Data Protection (SDP)	SDP1	0.806	3.423	0.836	0.836	0.670			
	SDP2	0.822	3.488						
	SDP3	0.824	3.479						
	SDP4	0.821	3.452						
System Integration (SIG)	SIG1	0.859	3.491	0.811	0.812	0.726			
	SIG2	0.862	3.464						
	SIG3	0.834	3.461						
Perceived Ease of Use and Compatibility (PEU)	PEU1	0.865	3.480	0.848	0.849	0.767			
	PEU2	0.877	3.502						
	PEU3	0.885	3.484						
Perceived operational Performance (OP)	OP						0.794	0.795	0.829

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Table 3 (cont.). Descriptive statistics, internal reliability and convergent reliability

Constructs	Items	Stage 1 (Level 2)					Stage 2 (Level 1)		
		Outer Loading	Mean	CA	C.R	AVE	CA	C.R	AVE
Perceived Financial Performance (PFP)	PFP1	0.752	3.349	0.845	0.847	0.564			
	PFP2	0.798	3.381						
	PFP3	0.771	3.315						
	PFP4	0.696	3.340						
	PFP5	0.757	3.349						
	PFP6	0.727	3.285						
Perceived None – Financial Performance (PNF)	PNF1	0.747	3.317	0.862	0.862	0.547			
	PNF2	0.725	3.322						
	PNF3	0.736	3.317						
	PNF4	0.721	3.222						
	PNF5	0.737	3.322						
	PNF6	0.771	3.335						
	PNF7	0.737	3.212						
Financial Reporting Quality (FRQ)	FRQ1	0.747	3.254	0.864	0.865	0.550	0.864	0.865	0.550
	FRQ2	0.730	3.263						
	FRQ3	0.753	3.249						
	FRQ4	0.748	3.295						
	FRQ5	0.745	3.331						
	FRQ6	0.761	3.301						
	FRQ7	0.708	3.194						
Usefulness of Accounting Information (UAI)	UAI1	0.753	3.379	0.899	0.899	0.585	0.899	0.899	0.585
	UAI2	0.761	3.302						
	UAI3	0.791	3.294						
	UAI4	0.772	3.370						
	UAI5	0.757	3.367						
	UAI6	0.774	3.349						
	UAI7	0.752	3.404						
	UAI8	0.758	3.313						
Top Management Support (TMS)	TMS1	0.887	2.998	0.917	0.926	0.751	0.917	0.927	0.751
	TMS2	0.876	3.018						
	TMS3	0.866	3.071						
	TMS4	0.874	3.110						
	TMS5	0.829	3.032						

Note: CR: Composite Reliability; AVE: Average Variance Extracted; CA: Cronbach's Alpha.

from 0.696 to 0.891, demonstrating strong indicator reliability. Although one indicator (PFP4) exhibits a loading of 0.696, which is slightly below the conventional 0.70 threshold, it was retained because its removal did not substantively improve composite reliability or average variance extracted (AVE), and it remains highly proximate to the acceptable level (Hu & Bentler, 1999). Regarding internal consistency reliability at the first-order level (Stage 1), Cronbach's Alpha (CA) values range from 0.811 to 0.917 (all exceeding the 0.60 threshold), and Composite Reliability (C.R.) values range from 0.812 to 0.926, well above the recommended threshold of 0.70. Convergent validity was established as the AVE values for all first-order constructs range from 0.547 to 0.780, exceeding the required threshold of 0.50 proposed by Fornell and Larcker (1981).

In Stage 2, the higher-order constructs were evaluated based on their specific measurement configurations. Because Perceived Operational Performance (OP) is specified as a reflective–reflective second-order construct, its higher-order reliability and validity were assessed using traditional reflective metrics. The second-order OP construct demonstrates excellent internal consistency reliability (CA = 0.794, C.R. = 0.795) and outstanding convergent validity (AVE = 0.829). At this stage, the other reflective constructs (FRQ,

Table 4. Evaluation of the formative second-order construct (Digital Accounting Implementation (DAI))

Second-Order Construct	First-Order Dimensions	Outer Weight	Outer Loading	t-statistic	p-value	95% BCI [2.5%, 97.5%]	Inner VIF	Statistical Significance
DAI	ATA	0.219	0.816	23.255	0.000	[0.201, 0.238]	2.107	Yes
	TLA	0.193	0.820	21.216	0.000	[0.175, 0.211]	2.241	Yes
	CCE	0.213	0.816	22.055	0.000	[0.194, 0.232]	2.118	Yes
	SDP	0.212	0.801	21.523	0.000	[0.192, 0.230]	1.981	Yes
	SIG	0.191	0.800	20.138	0.000	[0.173, 0.209]	2.055	Yes
	PEU	0.209	0.799	22.154	0.000	[0.190, 0.227]	1.981	Yes

Note: BCI = Bias-Corrected Bootstrap Confidence Interval based on 5,000 resamples; VIF = Variance Inflation Factor. ATA – Automation and Technology Adoption; TLA – Timeliness and Accuracy; CCE – Compliance and Cost Efficiency; SDP – Security and Data Protection; SIG – System Integration; PEU – Perceived Ease of Use and Compatibility.

UAI, and TMS) also maintain robust reliability and convergent validity, with CA ranging from 0.864 to 0.917, C.R. from 0.865 to 0.927, and AVE from 0.550 to 0.751.

In contrast, Digital Accounting Implementation (DAI) is conceptualized as a reflective–formative second-order construct. Consequently, reporting reflective reliability (CA and C.R.) and convergent validity (AVE) at the second-order level for DAI is methodologically inappropriate. Instead, the formative higher-order measurement model of DAI was rigorously evaluated in Stage 2 using collinearity diagnostics (Variance Inflation Factors (VIF)) and the significance of the outer weights of its six first-order dimensions, the results of which are reported and discussed in Table 4.

In Table 4, Collinearity diagnostics show that the inner VIF for the dimensions (ranging from 1.981 to 2.241) are well below the conservative threshold of 3.3, confirming that multicollinearity does not bias our estimates. Furthermore, the bootstrapping procedure with 5,000 resamples indicates that the outer weights of all six dimensions are statistically significant ($p < 0.01$). This confirms their strong relative importance in forming the multidimensional DAI construct. To support these findings, the outer loadings of all dimensions exceed the 0.50 threshold (ranging from 0.799 to 0.820), validating their substantial absolute relevance1. Consequently, the empirical evidence strongly supports the specified reflective–formative second-order measurement framework for DAI.

To assess discriminant validity at the second-order level (Stage 2), we applied the Heterotrait–Monotrait (HTMT) ratio of correlations proposed by Henseler et al. (2015), which is widely recognized as a superior and more sensitive criterion compared to the traditional Fornell-Larcker matrix in variance-based SEM.

In Table 5, even after these exclusions, all bilateral HTMT values among the latent constructs remain well below the conservative threshold of 0.85, ranging from 0.094 to 0.738. The highest HTMT value is observed between FRQ and UAI at 0.738, which is theoretically logical given their position in the sequential accounting information value chain. The HTMT ratio between DAI and OP stands at 0.689, confirming that these two second-order constructs represent empirically distinct phenomena. In sum, these results provide robust empirical evidence that all constructs in our model possess satisfactory discriminant validity and represent mutually exclusive conceptual boundaries.

Table 5. Results of discriminant validity assessment using HTMT (Stage 2)

Construct	DAI	FRQ	OP	TMS	UAI
DAI					
FRQ	0.461				
OP	0.689	0.652			
TMS	0.094	0.266	0.135		
UAI	0.560	0.738	0.690	0.263	

Note: FRQ – Financial Reporting Quality; UAI – Usefulness of Accounting Information

3.3. Structural model assessment

The evaluation of the PLS-SEM structural model involves examining multicollinearity, assessing model fit with the observed data, and evaluating the model's predictive capability. Multicollinearity is typically assessed using the inner Variance Inflation Factor (VIF), which should be below the

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Table 6. Structural model assessment results

Constructs/ Path	Inner VIF	R^2	R^2 adjusted	Q^2
FRQ		0.278	0.274	0.150
OP		0.485	0.480	0.396
UAI		0.536	0.533	0.310
DAI → FRQ	1.019			
DAI → OP	1.569			
DAI → UAI	1.301			
FRQ → OP	1.811			
FRQ → UAI	1.385			
TMS → FRQ	1.023			
TMS → OP	1.152			
TMS → UAI	1.109			
UAI → OP	2.156			
TMS × DAI → FRQ	1.032			
TMS × DAI → OP	1.142			
TMS × DAI → UAI	1.085			

threshold of 3 (Hu & Bentler, 1999). In addition, higher values of R^2 (predictive accuracy) and Q^2 (predictive relevance) indicate stronger explanatory power of the model (Hair et al., 2019). As reported in Table 6, the inner VIF values range from 1.019 to 2.156, all below the threshold of 3. This indicates that multicollinearity is not a concern and that the model is well-suited to the observed data. Furthermore, the R^2 values for FRQ, OP, and UAI are 0.278, 0.485, and 0.536, respectively. These results suggest that 48.5% of the variance in OP is explained by the constructs included in the model. In addition, the model yielded an SRMR value of 0.041, which is below the recommended threshold of 0.08, indicating a good fit between the model and the collected data.

Furthermore, to evaluate the predictive capability of the model, the results of the PLSpredict procedure presented in Table 7 indicate that the PLS-SEM_MAE values are lower than the LM_MAE values for all indicators. This finding suggests that the proposed model demonstrates good predictive performance with respect to the relationships associated with DAI.

To examine the proposed direct, indirect (mediating), and moderating relationships, path coeffi-

Table 7. PLSpredict result analysis.

Constructs	Indicator	Q^2predict	PLS-SEM_MAE	LM_MAE
FRQ	FRQ1	0.154	0.730	0.762
	FRQ2	0.149	0.696	0.715
	FRQ3	0.110	0.708	0.720
	FRQ4	0.147	0.699	0.715
	FRQ5	0.173	0.671	0.709
	FRQ6	0.175	0.711	0.741
	FRQ7	0.121	0.740	0.759
OP	PFP	0.341	0.684	0.689
	PNF	0.287	0.696	0.708
UAI	UAI1	0.235	0.727	0.744
	UAI2	0.236	0.665	0.698
	UAI3	0.240	0.684	0.706
	UAI4	0.259	0.700	0.735
	UAI5	0.199	0.694	0.717
	UAI6	0.201	0.698	0.723
	UAI7	0.185	0.714	0.743
	UAI8	0.247	0.700	0.740

Note: MAE: Mean absolute error; LM: linear regression model.

cients and corresponding p-values were used for hypothesis testing. Furthermore, to ensure the robustness and generalizability of the results, the model was re-estimated using a bootstrapping procedure with 5,000 resamples (Hair et al., 2014). The results of the hypothesis testing are presented in Figure 2 and the following tables.

The results presented in Figure 2 and Tables 8, 9 and 10 indicate the following.

3.3.1. Assessment of direct effects relationships

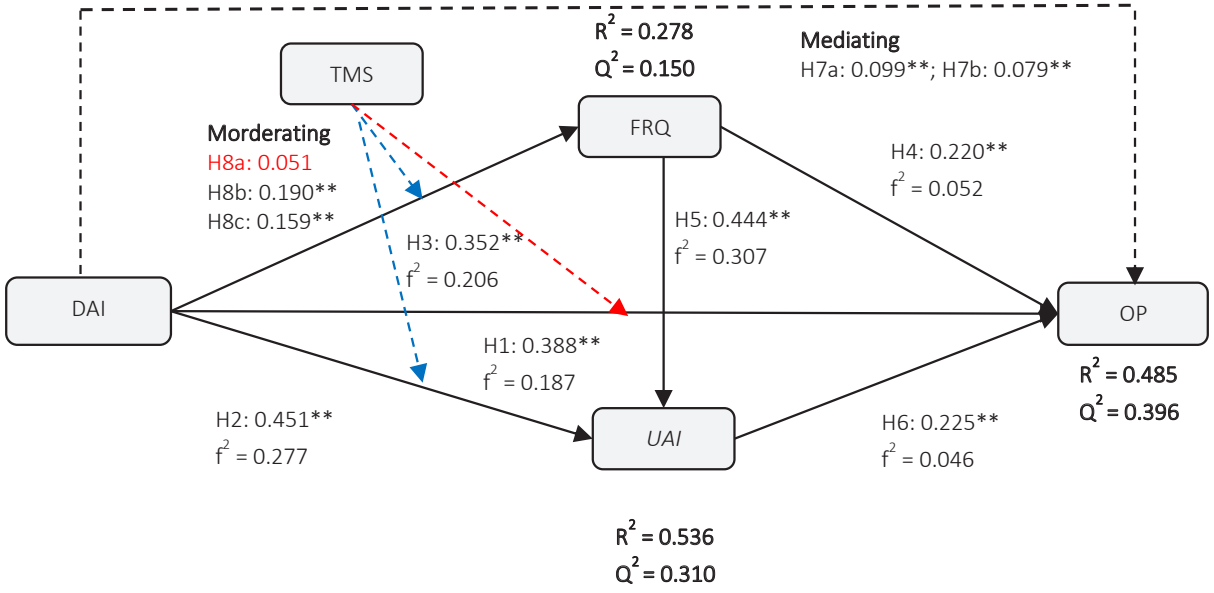
To assess the statistical significance of the hypotheses and the strength of direct effects, p-values (< 0.05) and effect size (f^2) were employed, following Cohen (1988). The interpretation thresholds for f^2 are as follows: $f^2 < 0.02$ indicates a negligible or no effect, $0.02 \leq f^2 < 0.15$ indicates a small effect, $0.15 \leq f^2 < 0.35$ indicates a medium effect, and $f^2 \geq 0.35$ indicates a large effect.

Based on the results reported in Table 8, all six hypothesized direct relationships (H1–H6) are statistically significant at the 95% confidence level. Furthermore, the f^2 values indicate that the relationship between FRQ and UAI is the strongest among the estimated paths ($f^2 = 0.307$). The relationships between DAI and FRQ ($f^2 = 0.277$), DAI and UAI ($f^2 = 0.206$), and DAI and OP ($f^2 = 0.187$) are of medium magnitude ($0.15 \leq f^2 < 0.35$).

In contrast, the relationships between UAI and OP ($f^2 = 0.046$) and between FRQ and OP ($f^2 = 0.052$) are relatively small in magnitude. These findings indicate that higher perceived levels of digital accounting implementation (DAI) are associated with higher perceived operational performance (OP), fi-

Table 8. Testing direct effects relationships

Path	Hypothesis	β	Standard deviation	P values	f^2	Confidence interval		Decision
						2.5%	97.5%	
DAI → FRQ	H2	0.451	0.031	0.000	0.277	0.390	0.511	Yes
DAI → OP	H1	0.388	0.037	0.000	0.187	0.314	0.461	Yes
DAI → UAI	H3	0.352	0.032	0.000	0.206	0.289	0.415	Yes
FRQ → OP	H4	0.220	0.040	0.000	0.052	0.138	0.294	Yes
FRQ → UAI	H5	0.444	0.035	0.000	0.307	0.374	0.511	Yes
UAI → OP	H6	0.225	0.041	0.000	0.046	0.143	0.308	Yes



Note: Direct relationship – black line; Moderating relationship – black dotted line; Mediating relationship – blue dotted line; Not significant relationship – red dotted line. ** p < 0.01; * p < 0.05.

Figure 2. Results of the PLS-SEM structural model testing

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nancial reporting quality (FRQ), and usefulness of accounting information (UAI), with associations of moderate magnitude. Similarly, FRQ is positively associated with UAI at a moderate level. The remaining relationships, specifically FRQ → OP and UAI → OP, are statistically significant but comparatively weaker in magnitude.

3.3.2. Assessment of indirect (mediating) effects

Continuing with the bootstrapping procedure (N = 5,000) in SmartPLS, the indirect paths specified in the proposed model were assessed. The results reported in Table 9 indicate five statistically significant indirect associations: DAI → FRQ → UAI (β = 0.200, p-value = 0.000), DAI → FRQ → UAI → OP (β = 0.045, p-value = 0.000), DAI → UAI → OP (β = 0.079, p-value = 0.000), FRQ → UAI → OP (β = 0.100, p-value = 0.000), and DAI → FRQ → OP (β = 0.099, p-value = 0.000). The corresponding 95% confidence intervals were [0.161, 0.244], [0.028, 0.065], [0.048, 0.114], [0.063, 0.140], and [0.061, 0.138], respectively.

Importantly, none of these confidence intervals included zero, indicating that the estimated indirect paths were statistically significant (Hair et al., 2014). Accordingly, the proposed indirect-association hypotheses H7a and H7b received empirical support. These findings suggest that the positive association between DAI and OP is statistically associated with FRQ and UAI through the indirect paths specified in the model.

To further examine the relative contribution of these indirect paths, the Variance Accounted For (VAF) index was calculated, and the results are presented in Table 10. The findings indicate that the estimated indirect associations accounted for 36.43% of the total estimated association between DAI and OP. Specifically, the indirect path DAI → FRQ → OP accounted for 16.17%, DAI → UAI → OP accounted for 12.90%, and the sequential indirect path DAI → FRQ → UAI → OP accounted for 7.35%.

Given the cross-sectional and self-reported nature of the data, these results should be interpreted as evidence of statistically significant indirect associations among perceived constructs rather than as evidence of causal mediation.

3.3.3. Assessment of moderating effects

Using the bootstrapping procedure with 5,000 resamples, the interaction relationships involving top management support (TMS) were examined for the three hypothesized associations. As reported in Table 11, hypotheses H8b and H8c received empirical support, whereas H8a did not. Specifically, the interaction terms between DAI and TMS were positively and significantly associated with FRQ (β = 0.190, p < 0.001) and UAI (β = 0.159, p < 0.001). These findings indicate that the positive associations between DAI and FRQ, and between DAI and UAI, were stronger at higher levels of TMS.

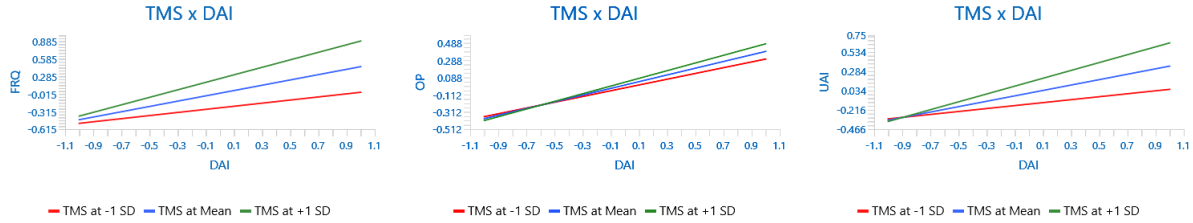
Table 9. Testing indirect effects relationships

Path	Hypothesis	β	Standard deviation	T statistics	P values	Confidence interval		Decision
						2.5%	97.5%	
DAI → FRQ → UAI		0.200	0.021	9.423	0.000	0.161	0.244	Yes
DAI → FRQ → UAI → OP		0.045	0.009	4.887	0.000	0.028	0.065	Yes
DAI → UAI → OP	H7b	0.079	0.017	4.753	0.000	0.048	0.114	Yes
FRQ → UAI → OP		0.100	0.020	5.063	0.000	0.063	0.140	Yes
DAI → FRQ → OP	H7a	0.099	0.020	4.986	0.000	0.061	0.138	Yes

Table 10. Testing the mediating roles of variables using the VAF index

Magnitude of Mediation Effects	Coefficient of Total Indirect Effects (1)	Coefficient of Total Effects (2)	VAF index (=1/ 2)
DAI → OP	0.223***	0.612***	**36.43%**
DAI → FRQ → UAI → OP	0.045***	0.612***	7.35%
DAI → UAI → OP	0.079***	0.612***	12.90%
DAI → FRQ → OP	0.099***	0.612***	16.17%

Note: *** p ≤ 0.001; ** p ≤ 0.01; * p ≤ 0.05.



Note: The interaction plot for OP is presented for visualization purposes only because the corresponding moderating effect (*H8a*) is not statistically significant.

Figure 3. Interaction plots (TMS on DAI → FRQ/UAI/OP)

Table 11. Testing moderating effects

Path	Hypothesis	β	STDEV	T statistics	P values	CIs		Decision
						2.5%	97.5%	
TMS x DAI → FRQ	H8b	0.190	0.035	5.485	0.000	0.121	0.258	Yes
TMS x DAI → OP	H8a	0.051	0.028	1.850	0.064	−0.002	0.107	No
TMS x DAI → UAI	H8c	0.159	0.026	6.217	0.000	0.109	0.209	Yes

In contrast, the interaction term between DAI and TMS in relation to OP was not statistically significant (β = 0.051, p = 0.064). Accordingly, *H8a* did not receive empirical support. This result suggests that the positive association between DAI and OP did not vary significantly across different levels of perceived TMS in the present sample. A possible interpretation is that perceived operational performance may be associated with a broader set of organizational and environmental conditions beyond managerial support alone.

Figure 3 presents interaction plots illustrating the associations between DAI and the three outcome variables at different levels of TMS. Consistent with the bootstrapping results reported in Table 11, the interaction plots for FRQ and UAI show increasingly steeper positive slopes as TMS increases from low (–1 SD) to high (+1 SD). These visual patterns are consistent with the statistically significant interaction terms observed for H8b and H8c and indicate that the positive associations between DAI and FRQ, and between DAI and UAI, were stronger at higher levels of TMS.

For OP, the interaction plot shows only a slight divergence among the three estimated regression lines across different levels of TMS. However, this visual pattern should not be interpreted as evidence of a statistically significant interaction because the corresponding interaction coefficient was not statistically significant (β = 0.051, p = 0.064). Accordingly, the OP interaction plot is presented solely to illustrate the estimated association and to facilitate comparison with the other two interaction patterns rather than to imply empirical support for H8a.

4. DISCUSSION

4.1. Direct relationships

The empirical findings are broadly consistent with the proposed TOE–RBV framework by indicating that DAI is positively associated with OP and that this association is statistically linked to FRQ and UAI. These findings suggest that digital accounting may be viewed as an important organizational capability whose perceived organizational relevance is closely related to the quality and usefulness of accounting information available for managerial decision-making.

First, DAI is positively associated with both FRQ (β = 0.451, p < 0.001) and UAI (β = 0.352, p < 0.001). The stronger association with FRQ suggests that higher perceived levels of DAI are more closely related to respondents' perceptions of financial reporting quality than to their perceptions of information usefulness. This pattern is consistent with the information value chain perspective, which proposes that higher-quality financial reporting is closely related to the perceived usefulness of

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accounting information for managerial decision-making. Similar positive associations have been reported by Ababneh (2021), Abu Afifa et al. (2025), Phornlaphatrachakorn and Na Kalasindhu (2021), Al-Okaily et al. (2023), and Al-Hattami (2025). Compared with these previous studies, the present research extends existing knowledge by examining FRQ and UAI simultaneously within an integrated TOE–RBV framework and by showing that these two constructs are jointly associated with perceived organizational outcomes related to DAI.

Second, FRQ exhibits the strongest association with UAI ($\beta = 0.444$, $f^2 = 0.307$), while UAI is positively associated with OP ($\beta = 0.225$, $p < 0.001$). These findings suggest that respondents who perceive higher FRQ also tend to perceive accounting information as more useful for managerial decision-making. The results are therefore consistent with the information value chain embedded in the proposed model and with the arguments of Dechow et al. (2010), Bushman and Smith (2001), and Al-Hattami et al. (2024), who emphasized the close relationship between financial reporting quality, information usefulness, and managerial decision-making. Whereas previous studies have often examined these relationships separately, the present study assesses them simultaneously within a unified structural model.

Third, although DAI is positively associated with OP ($\beta = 0.388$), the magnitude of this association ($f^2 = 0.187$) is lower than the combined magnitude of the estimated indirect associations involving FRQ and UAI. This pattern suggests that the relationship between DAI and OP may be more closely connected with information-related organizational conditions than with technology adoption alone. Such an interpretation is consistent with the RBV, which emphasizes that technological resources are most relevant when they are accompanied by organizational capabilities related to information processing and decision-making. Previous studies have similarly reported positive associations between DAI, FRQ, and operational outcomes, and the present study contributes by examining these relationships simultaneously in the banking sector of an emerging economy.

Overall, the statistical support for all hypothesized direct relationships is consistent with the proposed research model. The effect size analysis further indicates that the FRQ → UAI relationship represents the strongest association within the accounting information value chain, whereas the remaining relationships are of moderate or small magnitude. Collectively, these findings contribute to the literature by offering a more comprehensive account of how DAI, FRQ, UAI, and OP are interrelated in the context of Vietnamese commercial banks.

4.2. Indirect relationships

The analysis of the estimated indirect paths provides additional insights into the relationships among DAI, FRQ, UAI, and OP. Rather than suggesting that DAI is associated with OP only through a single direct relationship, the results indicate that DAI is statistically linked to OP through indirect paths involving FRQ and UAI. This pattern is consistent with a sequential information-value process in which perceptions of digital accounting implementation are associated with perceptions of financial reporting quality and information usefulness.

Among the estimated indirect paths, DAI → FRQ → UAI ($\beta = 0.200$) suggests that respondents who perceive higher levels of FRQ also tend to perceive accounting information as more useful. This pattern is consistent with the argument of Dechow et al. (2010) that information quality is closely related to the perceived usefulness of accounting information and highlights the important role of financial reporting within digital accounting processes.

Furthermore, the indirect paths DAI → FRQ → OP, DAI → UAI → OP, and the sequential path DAI → FRQ → UAI → OP indicate that DAI is statistically associated with OP through multiple interconnected relationships rather than through a single observed path. The VAF analysis is consistent with this interpretation, indicating that 36.43% of the total estimated association between DAI and OP is represented by the estimated indirect paths. Among these, the DAI → FRQ → OP path accounts for 16.17%, DAI → UAI → OP accounts for 12.90%, and the sequential path DAI → FRQ → UAI → OP accounts for an additional 7.35%.

These findings are broadly consistent with the RBV perspective, which emphasizes the importance of organizational capabilities related to information

processing and decision-making in conjunction with technological resources. They are also consistent with previous studies reporting positive associations among accounting information systems, information quality, information usefulness, and operational outcomes (Elbashir et al., 2008; Huy & Phuc, 2025).

Similarly, the prominent role of FRQ observed in the present model is consistent with the findings of Divyashree et al. (2024), Al-Dmour et al. (2023) and Abu Afifa & Nguyen (2023), who emphasized the close relationship between information quality and the perceived value of accounting information systems. Compared with previous studies, the present research contributes by examining a sequential indirect-association pattern in which DAI, FRQ, UAI, and OP are analyzed simultaneously within a unified structural model. This evidence provides a more comprehensive description of how these perceived organizational constructs are interrelated in the context of digital accounting transformation.

4.3. Moderating relationships

The interaction analysis indicates that the positive associations between DAI and FRQ, and between DAI and UAI, were stronger at higher levels of TMS, whereas the interaction between DAI and OP was not statistically significant. These findings suggest that managerial support is more closely associated with organizational conditions related to the implementation and use of digital accounting systems than with perceived operational performance directly.

Specifically, the statistically significant interaction terms involving DAI and TMS in relation to FRQ and UAI suggest that respondents who perceive stronger managerial commitment, greater resource availability, and more supportive organizational policies also tend to report stronger positive associations between DAI and both FRQ and UAI. This interpretation is broadly consistent with previous studies by Mujalli et al. (2024), Dwivedi et al. (2015), García-Sánchez et al. (2019), and Phornlaphatrachakorn and Na Kalasindhu (2021), which identified leadership commitment as an important organizational condition associated with digital transformation initiatives. Likewise, Al-Okaily et al. (2023) emphasized the close relationship between data-driven organizational cultures and the perceived organizational value of accounting information.

In contrast, the interaction between DAI and TMS in relation to OP was not statistically significant. This result suggests that the positive association between DAI and OP did not vary significantly across different levels of perceived TMS in the present sample. One possible interpretation is that perceived operational performance is associated with a broader set of organizational and environmental conditions, including operational capabilities, organizational learning, competitive conditions, and market dynamics. Accordingly, while TMS was associated with stronger DAI–FRQ and DAI–UAI relationships, its relationship with OP appears to be less pronounced in the present data.

Within the Vietnamese banking context, these findings are particularly relevant given the ongoing digital transformation initiatives in the financial sector. The results suggest that the strategic role of top management may be more closely related to fostering a data-oriented organizational environment and supporting the effective use of accounting information than to perceived operational performance directly. This study therefore contributes to the literature by providing a more nuanced understanding of how TMS is associated with the relationships among DAI, FRQ, UAI, and OP within the TOE–RBV framework.

4.4. Research limitations and future research directions

Despite providing valuable empirical insights into the digitalization of the banking sector, this study is subject to several methodological limitations.

First, the most prominent limitation concerns the nested structure of our dataset, where 562 individual accountants and managers are nested within 27 commercial banks. Due to the limited sample size at the institutional level (N = 27), aggregating the individual responses to the bank level was statistically unfeasible, as it would severely compromise the statistical power required for estimating our complex multi-stage PLS-SEM model. Consequently, we reframed our unit of analysis to the individual level, interpreting all

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variables as perceived constructs (individual-level evaluations of perceived organizational attributes) rather than objective bank-level outcomes. Future research should aim to expand the institutional sample size to permit the calculation of formal within-group agreement statistics (such as wg, ICC(1), and ICC(2)) to justify aggregation, or employ advanced Multilevel Structural Equation Modeling (MSEM) to explicitly account for nested data dependencies.

Second, this study relies exclusively on subjective, self-reported perceptions of DAI and OP. While subjective measures from key informants are widely accepted in organizational research when objective data are confidential or inaccessible, they may introduce cognitive biases. Future studies are encouraged to integrate objective, secondary source data - such as audited financial ratios (e.g., ROA, NIM, and cost-to-income ratio) from annual reports or actual IT expenditure volumes - to triangulate with perceived survey measures

Third, the cross-sectional and self-reported nature of the data limits the extent to which causal relationships can be established. The observed relationships should therefore be interpreted as empirical associations rather than definitive evidence of causality. Future research could employ longitudinal designs, objective accounting and performance data, or multiple informants from the same organization to strengthen causal inference and reduce potential common method effects.

Finally, although we established clear theoretical boundaries for semantic indicators like 'timeliness' and 'accuracy' based on the accounting information value chain, the potential for construct contamination remains an inherent challenge in survey-based accounting research. Future studies should refine and customize these measurement scales to enforce sharper empirical distinctions between system capabilities (inputs), reporting quality (outputs), and decision-making utility (outcomes) in various institutional contexts.

CONCLUSION

This study examined the relationships among DAI, FRQ, UAI, TMS, and OP in commercial banks operating in an emerging economy. The findings indicate that DAI is positively associated with OP both directly and through indirect paths involving FRQ and UAI, highlighting the importance of information-related constructs in the observed relationships between DAI and perceived organizational outcomes. The results further show that higher perceived levels of FRQ are associated with higher perceived levels of UAI, while the positive associations between DAI and both FRQ and UAI were stronger at higher levels of perceived TMS. Collectively, these findings are broadly consistent with the proposed research framework and underscore the interrelated nature of technological capability, information quality, and organizational support in the context of banking digital transformation.

Based on these findings, it may be concluded that the perceived organizational relevance of DAI is not associated solely with the adoption of digital technologies. Rather, DAI is more closely associated with favorable perceived organizational outcomes when respondents perceive higher levels of accounting information quality and usefulness and stronger managerial support. These findings extend the application of the TOE framework and the RBV by suggesting that technological resources are closely related to organizational outcomes when accompanied by supportive organizational conditions and information-related capabilities. Accordingly, digital accounting may be viewed not only as a technological innovation but also as an important organizational capability associated with information quality, managerial decision-making, and perceived operational performance in an increasingly digital business environment.

AUTHOR CONTRIBUTIONS

Conceptualization: Cuong Bui Manh, Hai Phan Thanh.
Data curation: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Formal analysis: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.

Investigation: Cuong Bui Manh.
Methodology: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Project administration: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Resources: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Software: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Supervision: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Validation: Cuong Bui Manh, Hai Phan Thanh.
Visualization: Cuong Bui Manh.
Writing – original draft: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.
Writing – reviewing & editing: Cuong Bui Manh, Hai Phan Thanh, Cuong Nguyen Thanh.

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APPENDIX A. Survey item constructs

Construct	Statement	Resource
ATA	**Automation and Technology Adoption**	
ATA1	The bank's digital accounting system automates core accounting tasks (e.g., recording, classification, and aggregation of transactions) with minimal manual intervention	Sampaio and Silva (2025); Expert opinions
ATA2	The digital accounting system enables automatic collection, processing, and updating of financial data from multiple sources	Xing (2024); Expert opinions
ATA3	The system is capable of integrating and automatically processing data across departments (e.g., accounting, credit, and payments)	Nassani et al. (2023); Expert opinions
ATA4	Automation within the accounting system significantly reduces repetitive tasks and enhances the efficiency of financial information processing	Sampaio and Silva (2025); Expert opinions
ATA5	The bank adopts advanced technologies (e.g., AI, RPA, cloud, ERP) to automate accounting and financial processes.	Silva et al. (2025); Expert opinions
TLA	**Timeliness and Accuracy**	
TLA1	The digital accounting software features high-speed, real-time data processing and computing capabilities.	Zohry and Al-Dhubaibi (2024); Expert opinions
TLA2	Financial data are continuously and automatically updated across the system's database infrastructure.	Hakimi et al. (2024); Experts' opinions
TLA3	The digital system employs automated data validation controls to minimize transaction processing discrepancies.	Hakimi et al. (2024); Expert opinions
TLA4	The software architecture enforces built-in algorithmic checks to prevent ledger consolidation errors.	Lutfi (2023); Expert opinions
CCE	**Compliance and Cost Efficiency**	
CCE1	The bank's digital accounting system ensures full compliance with current regulations and accounting standards (e.g., IFRS, central bank regulations).	Qatawneh and Al-Okaily (2024); Expert opinions
CCE2	The system supports automated monitoring and detection of irregularities, thereby enhancing compliance in accounting practices.	
CCE3	Implementing digital accounting reduces administrative and material expenses specifically related to ledger maintenance and data archiving.	
SDP	**Security and Data Protection**	
SDP1	The digital accounting system ensures the confidentiality of financial information and prevents unauthorized access.	Nhan et al. (2022); Expert opinions
SDP2	The system includes clear access control and user authorization mechanisms.	Mahdi (2021); Expert opinions
SDP3	The system is capable of detecting and preventing security threats (e.g., cyberattacks, unauthorized access).	Nhan et al. (2022); Expert opinions
SDP4	Accounting data are securely protected during storage, processing, and transmission (e.g., backup, encryption, data protection)	
SIG	**System Integration**	
SIG1	The digital accounting system is effectively integrated with other systems within the bank (e.g., core banking, ERP, payment systems)	Thong (1999); Expert opinions
SIG2	The system enables seamless sharing and synchronization of accounting data across departments	Nicolaou (2000); Expert opinions
SIG3	The digital accounting system supports efficient data exchange with external systems (e.g., partners, regulators)	
PEU	**Perceived Ease of Use**	
PEU1	The digital accounting system is user-friendly and easy to use in performing accounting tasks	Apsari et al. (2023); Expert opinions
PEU2	Users can easily learn how to operate and interact with the digital accounting system	Andarwati et al. (2019); Expert opinions
PEU3	The digital accounting system fits job requirements and effectively supports users' tasks	Apsari et al. (2023); Expert opinions
PFP	**Perceived Financial Performance**	
PFP1	Revenue increases	Aldhaheri and Ahmad (2024); Tsou and Chen (2023); Expert opinions
PFP2	Improvement in return on assets (ROA)	
PFP3	Improvement in net interest margin (NIM)	
PFP4	Improvement in the cost-to-income ratio (CIR)	
PFP5	Increase in overall profitability	
PFP6	The bank achieves a significant reduction in bank-wide total operational expenditures	

Construct	Statement	Resource
PNF	**Perceived Non-Financial Performance**	
PNF1	Improvement in process efficiency and task completion time	Elbashir et al. (2008); Chen et al. (2016); Expert opinions
PNF2	The bank successfully automates and digitalizes its front-office customer service touchpoints and daily transactional workflows	Tseng & Lee (2014); Expert opinions
PNF3	Increased customer satisfaction	Al-Dmour et al. (2020); Expert opinions
PNF4	Reduced transaction cost and time for customers	Elbashir et al. (2008); Expert opinions
PNF5	Increased employee satisfaction	Chen et al. (2016); Expert opinions
PNF6	Improved employees' capability in processing and decision-making	Aldhaheri and Ahmad (2024); Chen et al. (2016); Expert opinions
PNF7	Enhanced innovation and development of banking products and services	Chen et al. (2016); Expert opinions
FRQ	**Financial Reporting Quality**	
FRQ1	The final financial statements represent a faithful, error-free, and fully audited account of the bank's financial status	Divyashree et al. (2024); Expert opinions
FRQ2	Financial statements provide neutral and unbiased information	
FRQ3	Financial statements present reliable and verifiable information	
FRQ4	Financial information can be quickly retrieved through digital systems	
FRQ5	Financial statements are published in strict compliance with the statutory disclosure deadlines set by regulatory authorities	
FRQ6	Financial statements comply with accounting standards and regulatory requirements	
FRQ7	Financial statements provide complete and transparent information on financial conditions and risks	
UAI	**Usefulness of Accounting Information**	
UAI1	The bank's accounting information is comparable with information disclosed by the bank itself or other organizations in the industry	Al-Dmour et al. (2023)
UAI2	Accounting information provides feedback on past events and transactions	Abu Afifa et al. (2025); Al-Dmour et al. (2023)
UAI3	Accounting information has predictive value and enhances decision-making effectiveness	Ababneh (2021); Expert opinions
UAI4	The language used in accounting information is understandable to users	Al-Dmour et al. (2023); Expert opinions
UAI5	Accounting information clearly explains assumptions and estimates with reasonable justification	Abu Afifa et al. (2025); Al-Dmour et al. (2023); Expert opinions
UAI6	Accounting information presents both positive and negative aspects of business performance in a balanced manner	
UAI7	Critical accounting insights are readily available on-demand to support immediate tactical and strategic decisions	
UAI8	Accounting information effectively supports risk control	
TMS	**Top Management Support**	
TMS1	Top management clearly recognizes the benefits of digital accounting implementation	Mujalli et al. (2024); Expert opinions
TMS2	Top management proactively integrates digital accounting into the bank's strategic development and governance	Dwivedi et al. (2015); Expert opinions
TMS3	Top management promotes a data-driven culture and digital innovation in accounting and banking operations	Mujalli et al. (2024); Expert opinions
TMS4	Top management provides sufficient financial resources for digital accounting implementation	García-Sánchez et al. (2019); Mujalli et al. (2024); Expert opinions
TMS5	Top management restructures work processes to leverage technological opportunities within the organization	

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APPENDIX B. Number of survey responses at commercial banks

No.	Name of the Joint Stock Commercial Bank	Date of establishment	Stock code	Number of survey responses	Notes
1	Joint Stock Commercial Bank for Foreign Trade of Vietnam	01/04/1963	VCB	42	
2	Viet Nam Technological and Commercial Joint Stock Bank	27/09/1993	TCB	36	
3	Joint Stock Commercial Bank for Investment and Development of Vietnam	26/04/1957	BID	38	
4	Military Commercial Joint Stock Bank	04/11/1994	MBB	29	
5	Vietnam Joint Stock Commercial Bank of Industry and Trade	26/03/1988	CTG	30	
6	Asia Commercial Joint Stock Bank	04/06/1993	ACB	16	
7	Vietnam Commercial Joint Stock Bank for Private Enterprise	12/08/1993	VPB	18	
8	Ho Chi Minh city Development Joint Stock Commercial Bank	04/01/1990	HDB	26	
9	Saigon-Hanoi Commercial Joint Stock Bank	13/11/1993	SHB	18	
10	Fortune Vietnam Joint Stock Commercial Bank	28/03/2008	LPB	15	
11	Saigon Thuong Tin Commercial Joint Stock Bank	21/12/1991	STB	17	
12	Vietnam International Commercial Joint Stock Bank	18/09/1996	VIB	17	
13	TienPhong Commercial Joint Stock Bank	05/05/2008	TPB	21	
14	Vietnam Maritime Joint Stock Commercial Bank	12/07/1991	MSB	18	
15	Southeast Asia Joint Stock Commercial Bank	24/03/1994	SSB	16	
16	Nam A Joint Stock Commercial Bank	21/10/1992	NAB	15	
17	Orient Joint Stock Commercial Bank	10/06/1996	OCB	18	
18	Vietnam Export-Import Joint Stock Commercial Bank	24/05/1989	EIB	22	
19	Viet Nam Thuong Tin Joint Stock Commercial Bank	02/02/2007	VBB	39	
20	Bac A Joint Stock Commercial Bank	01/09/1994	BAB	16	
21	Viet A Joint Stock Commercial Bank	04/07/2003	VAB	12	
22	Kien Long Joint Stock Commercial Bank	27/10/1995	KLB	15	
23	Prosperity and Growth Commercial Joint Stock Bank	13/11/1993	PGB	15	
24	An Binh Joint Stock Commercial Bank	13/05/1993	ABB	14	
25	Saigon Bank for Industry and Trade	03/07/1987	SGB	13	
26	Ban Viet Commercial Joint Stock Bank	25/12/1992	BVB	14	
27	National Citizen Commercial Joint Stock Bank	18/09/1995	NVB	12	
28	Saigon Commercial Bank	01/01/2012	SCB	0	This bank is currently under special supervision, and its shares have been suspended from trading
29	Bao Viet Commercial Joint Stock Bank	14/01/2009		0	This bank is not currently listed on any official stock exchange
30	Vietnam Public Joint Stock Commercial Bank	16/09/2013		0	This bank is not currently listed on any official stock exchange
31	Vikki Digital Bank Limited	14/02/2025		0	This bank is subject to a compulsory transfer to HD Bank
32	Modern Bank of Vietnam Limited	18/12/2024		0	This bank is subject to a compulsory transfer to MB Bank
33	Generation of Prosperity Sole Member Limited Commercial Bank	08/10/2025		0	This bank is subject to a compulsory transfer to VP Bank
34	Vietcombank Neo Limited	17/01/2025		0	This bank is subject to a compulsory transfer to VCB
	Total			562	