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Exploring AI-Enabled Cloud Transformation Towards Digitalization Value in Accounting Firms

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Abstract

This study examines how AI-enabled, cloud-based accounting platforms generate digitalization value within Thai accounting firms by identifying the internal mechanisms through which cloud capability and cloud user capability translate into economic outcomes. Using survey data from 360 cloud-using firms, we employed covariance-based structural equation modeling with maximum likelihood estimation and bias-corrected bootstrapping (5,000 resamples) to test direct and mediated pathways. The results show that the qualitative of accounting information produced by cloud systems strongly enhances digitalization value added ($\beta = 0.49$, $p < 0.001$) and promotes proactive work behavior ($\beta = 0.59$, $p < 0.001$). Proactive work behavior further contributes to digitalization value added ($\beta = 0.30$, $p < 0.01$). Cloud user capability improves information quality ($\beta = 0.19$, $p < 0.05$) and proactive behavior ($\beta = 0.35$, $p < 0.01$), while cloud attributes improve information quality ($\beta = 0.10$, $p < 0.05$). Mediation analysis confirms that value arises indirectly via the sequential chain from cloud capability to information quality and then to proactive behavior, indicating that technical readiness alone is insufficient without informational uplift and behavioral execution. Theoretically, we extend information-systems and capability-based perspectives by positioning qualitative accounting information and proactive work behavior as the conversion channels that render cloud technology economically meaningful. Practically, firms and regulators should shift emphasis from infrastructure deployment to managing information quality, building user capability, and institutionalizing proactive work routines within AI-enabled cloud settings so that cloud adoption yields measurable value.

Keywords:

AI-Enabled Cloud;
Accounting Information System;
Proactive Work Behavior;
Digitalization Value Added;
Thailand.

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1- Introduction

Thailand's digital transformation has been framed by the Digital Development Plan for the Commercial Economy 2023–2027, which aligns technology investment across the Ministry of Commerce and calls for translating digital initiatives into results in the real economy [1]. For the accounting profession, such policy direction creates a supportive environment for adopting Accounting Information System (AIS) and cloud platforms, enabling firms to realign operating models for the digital economy and move toward becoming digital accounting firms with stronger professional standards and governance [1, 2]. Within this policy context, AIS quality, defined in the Thai professional literature as completeness, reliability, timeliness, usability, and responsiveness [3], is treated not merely as an IT function but as a backbone of transparency, assurance, and digitalization value added through AI-enabled cloud platforms.

Recently, the Thailand 4.0 agenda has promoted AI literacy among accounting professionals to cultivate a new generation of accountants who are capable of data-driven and AI-assisted work. In alignment with this direction, digital government initiatives in Thailand have also sought to raise digital readiness across sectors, including accounting firms, which has accelerated the adoption of AI-assisted cloud platforms such as GPTs to support financial data analysis and

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the creation of digitalization value [4, 5]. In 2023, 835,011 entities filed financial statements, while only 10,156 accounting firms were operating nationwide (≈1.22%), indicating a highly fragmented market with an unequal capacity to absorb digital transformation [4, 6]. However, the Thai auditing environment remains constrained by uneven AI literacy and limited platform integration across small firms, which restricts AI adoption beyond basic compliance-oriented tasks.

Public reports further indicate that although e-filing, AI-enabled cloud platforms, and digital reporting have expanded in formal adoption, many firms still use these tools mainly for compliance rather than for analysis or decision support, revealing a gap between digital adoption and digital value use [6, 7]. Persistent disparities in resources, skills, and day-to-day technological application continue to weaken the translation of national policy into firm-level practice [4].

Prior literature indicates that technology adoption alone rarely generates business value unless organizational readiness, user capability, and information quality improve together, which implies that capability building must complement procurement of tools [8–10]. However, many studies treat technology and human factors as separate domains and fail to explain how these inputs are converted into value through internal mechanisms such as AIS quality and proactive work behavior, even though public- sector evidence has shown that proactive behavior functions as a behavioral conduit through which internal capacity is translated into performance outcomes [11]. This leaves a theoretical gap in contexts like Thailand where formal policy commitment exists but capability translation remains uncertain.

To address this gap, the present study specifies a causal framework in which cloud capability and cloud users influence AIS quality, and AIS quality encourages proactive work behavior, which contributes to digitalization value-added creation inside accounting firms. The framework is grounded in information systems success logic and dynamic capability reasoning and incorporates firm readiness as a conditioning factor that can strengthen or weaken these links. This allows the study to test both direct relationships and indirect pathways that explain how policy intentions can translate into practice [9, 10]. Guided by this framework, the study also designs and applies an automated readiness assessment for accounting offices to gauge their capacity to implement cloud platforms in support of AIS quality, allowing the analysis to distinguish compliance-oriented use from value-creating use.

On this conceptual basis, the research question that arises is: *How and to what extent do cloud capability, cloud users, AIS quality, Proactive Work Behavior, and firm readiness interact to generate digitalization value added inside accounting firms, including through indirect and mediated paths that can be identified and tested empirically?*

In this study, "AI-enabled cloud" refers to the operating context of cloud attributes and cloud user capability in the structural model. This work advances the literature by offering a theory-based explanation of the internal mechanism that connects Thailand's digital transformation policy to firm-level outcomes in the accounting sector [1]. By mapping the pathway from cloud capability and user readiness to digitalization value added through AIS quality and proactive work behavior, and by embedding an automated readiness assessment into the analysis, the study not only enables empirical testing but also generates actionable implications for research, policy, and managerial intervention aimed at strengthening accounting professional capacity in emerging economies.

The remainder of this article is structured as follows: Section 2 reviews the literature and theoretical foundation; Section 3 develops hypotheses; Section 4 describes the methodology; Section 5 presents results; Section 6 discusses findings; and Section 7 concludes.

2- Literature Review

2-1- Theories Related to the Study

According to the Technology Acceptance Model (TAM), technology is adopted when users perceive it to be useful and easy to use [8, 12]. In the context of cloud-based accounting, this implies that user competence and attitudes determine whether cloud systems are used merely to comply with regulatory requirements or to generate value in practice. However, prior applications of TAM typically stop at adoption decisions and do not clarify how post-adoption use shapes AIS quality or digital outcomes, leaving a theoretical opening for a causal explanation that treats adoption as a mechanism rather than a terminal state [8]. The TAM framework explains user acceptance, while the RBV complements it by explaining how accepted technologies become firm-specific capabilities that drive sustained value.

Related to system outcomes, the IS Success Model proposes that information quality, system quality, and service quality together shape usage and organizational benefit [9]. For cloud-based AIS, information quality functions as the channel that converts digital infrastructure into usable output. Existing studies generally validate this model descriptively but seldom test whether AIS quality mediates the effect of cloud capability on value creation in accounting firms, which motivates the present study to reposition AIS quality as a transmission construct.

From a legitimacy perspective, stakeholder theory posits that accounting systems must satisfy the needs and expectations of actors who rely on financial information, including regulators, clients, and firm owners [13]. Cloud AIS adoption is therefore not solely a technical decision but also a response to stakeholder trust and compliance expectations. Yet these legitimacy forces are rarely modeled as internal behavioral drivers that link cloud investment to information improvement or proactive work behavior, reinforcing the need to integrate technology-related behavioral mechanisms into the causal chain.

In the strategic view, the Resource-Based View (RBV) holds that competitive advantage arises when firms develop capabilities that are valuable, rare, and difficult to imitate [14]. Under this perspective, digitalization value in accounting firms does not arise from cloud or AI technology per se but from the firm's capacity to convert digital capability into differentiation, credibility, and competitive advantage. Much of the existing research stops at efficiency or compliance outcomes without tracing the internal conversion path toward defensible value, which is a gap addressed in the present study.

From an adoption standpoint, the Technology–Organization–Environment (TOE) framework explains that digital decisions arise from technological readiness, organizational conditions, and environmental pressure [8, 15]. In Thailand, policy pressure is high while readiness varies, particularly among small audit firms. This explains the uneven digital uptake in the Thai auditing environment, which remains constrained by uneven AI literacy and limited platform integration, often restricting AI adoption to basic compliance tasks. Prior TOE-based studies commonly end at the point of adoption and do not examine what happens internally after adoption, supporting an extension toward post-adoption pathways that lead to digitalization value added.

From a dynamic capability perspective, organizations must continually reconfigure digital resources to sustain benefit under changing conditions [10]. AIS quality and proactive work behavior are consistent with this view because they represent the internal reconfiguration through which cloud capability becomes an actionable advantage. Nonetheless, prior accounting studies rarely conceptualize these elements as mediators between cloud systems and digital outcomes, providing theoretical justification for their role as internal transmission mechanisms in this research. While institutional theory could also explain cloud adoption as a response to coercive or normative pressures, the present study prioritizes capability conversion over conformity and therefore emphasizes mechanisms that translate cloud capability into actualizable value rather than institutional compliance.

2-2- AI Technology-Led Enablers in Accounting Digitalization

Existing literature recognizes cloud platforms as structural enablers of information quality, flexibility, and process rationalization in accounting. In practice, cloud platforms increasingly embed generative AI features such as GPT-based query tools and AI-driven big data analysis, but technology alone does not generate value without internal conversion mechanisms [5]. Consistent with TAM–TOE reasoning or socio-technology readiness, adoption may be explained by perceived usefulness, organizational readiness, and environmental pressure. However, these conditions do not account for whether technology is subsequently converted into information quality or behavioral change that yields value [8]. Empirical reports show that many firms use cloud systems, including AI-assisted functions, mainly for compliance or storage without improving information quality or work practice [4, 6], indicating that the bottleneck lies not in access to tools but in the absence of internal conditions that convert them into quality information and proactive work behavior.

2-3- Human-Capability Conditions for AIS Conversion

Evidence from adjacent literature indicates that improvements in information reliability, timeliness, and usability do not arise automatically from system adoption but depend on users' capability to operate, interpret, and apply digital tools as part of work routines [16, 17]. When user capability is weak, AIS remains under-utilized and digital tools, including AI-assisted features such as GPT-based query aids or copilots, function merely as record-keeping or user interface tools rather than as inputs for analytical or strategic action. Conversely, when users are able to reskill and apply technology in task execution, the same system produces observable gains in information completeness, error detection, and decision support [18, 19]. This implies that users are not merely system operators but behavioral carriers through which technical features are translated into organizational output.

2-4- Behavioral Activation as a Missing Lever in Value Realization

Beyond qualitative accounting information system, recent studies argue that proactive work behavior is a necessary behavioral lever that activates the benefits of information quality by pushing users to anticipate, signal, and act upon emerging patterns rather than waiting passively for instructions [20, 21]. Without such proactive conversion, high-quality information remains inert and cannot materialize into differentiation, credibility, or competitive gain. This positions Proactive Work behavior not as an optional behavioral trait but as a mediating condition that determines whether AIS quality is expressed in the form of digitalization value added. In this sense, technology and information are enabling inputs, while behavior is the channel that makes their effects observable at outcome level.

2-5- Unresolved Causal Chain and the Rationale for the Present Study

Prior studies show only partial links: cloud capability improves information quality, user capability shapes information use, and proactive behavior drives value [5, 8], while AI-assisted functions within cloud platforms (e.g., GPT-based copilot assistance) are discussed descriptively rather than as part of a tested mechanism. An integrated causal explanation of how policy pressure and AI-enabled cloud deployment translate into digitalization value in accounting firms is still missing. This study addresses that gap by modeling the pathway from cloud and users to value through AIS quality and proactive behavior in the Thai context.

3- Hypotheses Development

In this study, the term "AI-enabled cloud transformation" refers to the operating context within which the constructs of cloud attributes and cloud user capability function. It is therefore not modeled as a separate variable in the structural model. Guided by this causal logic, the present study specifies the following direct and mediated hypotheses.

3-1- Cloud Attributes (CCA)

Cloud attributes include ease of use, flexibility, security, and stability, and these qualities enhance the reliability, completeness, timeliness, and usability of accounting information when embedded in AIS [17, 22]. In practice, many cloud solutions also enable AI-assisted features such as GPT-based query aids; however, the realized value of such features still depends on the same underlying properties of system stability, accessibility, and trust. A technically stable and trusted cloud reduces processing risk, improves accessibility, and strengthens the structural base from which AIS quality is formed.

H1: *Cloud attributes have a positive direct effect on qualitative accounting information system (QAIS).*

Cloud attributes can also transmit value indirectly if quality improvements in AIS become the channel through which technical properties are realized in outcomes.

H7: *Cloud attributes have a positive indirect effect on digitalization value added (DVA) through the qualitative accounting information system.*

3-2- Cloud Users (CCU)

Users who reskill, apply technology in work routines, and monitor usage effectiveness improve both the qualitative accounting information system and the behavioral expression of that information [16, 18, 23]. Skilled users are more likely to interpret, validate, and act on information rather than input data passively.

H2: *Cloud users have a positive direct effect on qualitative accounting information system (QAIS).*

H5: *Cloud users have a positive direct effect on proactive work behavior (PA).*

User capability can also propagate value indirectly if its influence flows through internal mechanisms.

H8: *Cloud users have a positive indirect effect on digitalization value added through the qualitative accounting information system.*

H9: *Cloud users have a positive indirect effect on digitalization value added through proactive work behavior.*

3-3- Qualitative Accounting Information System (QAIS)

QAIS, defined by completeness, timeliness, reliability, usability, and responsiveness, provides the foundation from which digital initiatives create value for firms and stakeholders [17, 19]. High-quality information also enables behavioral activation by giving employees sufficient confidence and clarity to act in advance of instructions.

H3: *Qualitative accounting information system have a positive direct effect on digitalization value added (DVA).*

H6: *Qualitative accounting information system have a positive direct effect on proactive work behavior (PA).*

AIS quality may also operate as a conversion mechanism that turns information into value via proactive action.

H10: *Qualitative accounting information system have a positive indirect effect on digitalization value added through proactive work behavior.*

3-4- Proactive Work Behavior (PA)

Proactive work behavior, including cognitive anticipation, forward planning, and continuous improvement, is the behavioral channel through which high-quality information is expressed as competitive outcomes [20, 21]. Without proactive expression, even high-quality AIS remains inert.

H4: *Proactive work behavior has a positive direct effect on digitalization value added (DVA).*

3-5- Digitalization Value Added (DVA)

Digitalization value added reflects the extent to which AI-Enabled Cloud accounting systems generate visible business benefits such as enhanced corporate image, service differentiation, and competitive advantage [23]. It is treated as the ultimate outcome variable to capture whether digital investment leads to substantive rather than symbolic gains inside accounting firms. The proposed research model is shown in Figure 1.

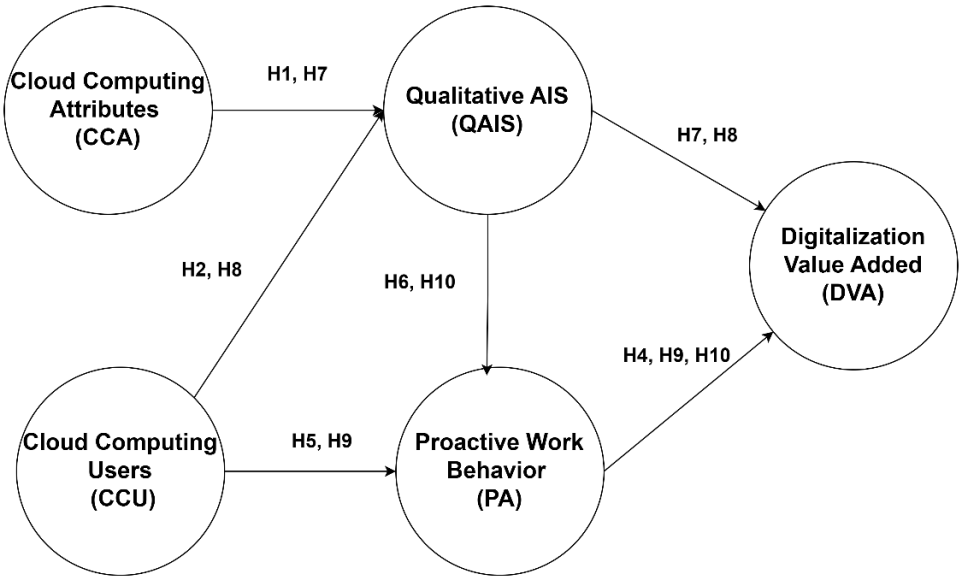


Figure 1. Proposed Research Model

4- Research Methodology

4-1- Data Analysis Techniques

Covariance-based structural equation modeling (CB-SEM) using AMOS with Maximum Likelihood (ML) estimation is employed to test the hypotheses and to evaluate the adequacy of the proposed causal model linking CCA, CCU, QAIS, PA, and DVA. CB-SEM is appropriate for theory confirmation, reflective constructs, and pre-specified mediation. Key evaluation indicators used in this study include:

- ***Standardized Factor Loadings***

Loadings ≥ 0.60 are accepted for individual indicator reliability; items in 0.50–0.59 are retained only if theoretically essential and if CR and AVE remain acceptable.

- ***Convergent Validity***

Cronbach's α ≥ 0.70, Composite Reliability (CR) ≥ 0.70, and Average Variance Extracted (AVE) ≥ 0.50.

- ***Discriminant Validity***

Discriminant validity was assessed using the Heterotrait–Monotrait (HTMT) ratio, applying the conservative threshold of < 0.85.

- ***Multicollinearity Diagnostics***

Inter-construct correlation r < 0.80 and VIF < 3.0 indicate the absence of multicollinearity.

- ***Global Model Fit***

Evaluated using χ^2/df (≤ 3.0 desirable), RMSEA (≤ 0.08), RMR (≤ 0.08), CFI/TLI (≥ 0.90), GFI (≥ 0.90), and AGFI (≥ 0.85).

- ***Mediation and Structural Relationships***

Direct and indirect effects are examined using bias-corrected bootstrapping (5,000 resamples; 95% CIs). Explanatory strength of endogenous constructs is interpreted via R^2 and effect sizes via Cohen's f^2 (computed externally on factor scores for interpretive support) [24].

4-2- Questionnaire Design, Sampling and Data Collection

The structured questionnaire consisted of two parts. Part 1 captured demographic and firm-level attributes, including respondent role, firm age, number of accounting staff, and duration of cloud usage. Part 2 comprised 18 reflective items measuring five latent constructs (CCA, CCU, QAIS, PA, and DVA) using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

All items were adapted from validated sources and contextualized for cloud-based AIS use in Thai accounting firms. Content validity was verified through expert review (IOC = 0.60–1.00), and a pilot test with 30 respondents confirmed item clarity and acceptable discrimination (DI > 0.30). Purposive sampling was used to include only firms actively employing cloud platforms in AIS workflows. A total of 385 questionnaires were returned, and 360 complete cases were retained for CB-SEM, which meets the recommended minimum sample size for theory-testing SEM models [25, 26].

The sample is structurally aligned with the target population of cloud-using accounting firms in Thailand. Over half of the responses were provided by owners or partners (54.2%), ensuring decision-relevant input. In terms of firm maturity, 41.4% had operated for 6–10 years, and 48.6% employed fewer than ten staff, reflecting the dominance of small and medium-sized practices (see Table 1).

Table 1. Survey Sample Description (n = 360)

Variable	Category	n	%
Respondent Role	Owner/Partner	195	54.2
	Accounting Manager	104	28.9
	Senior Accountant	61	16.9
Firm Age (Years)	< 5 years	76	21.1
	6–10 years	149	41.4
	> 10 years	135	37.5
Number of Accounting Staff	< 10 employees	175	48.6
	10–30 employees	132	36.7
	> 30 employees	53	14.7
Cloud Usage Duration	1–3 years	141	39.2
	4–6 years	125	34.7
	> 6 years	94	26.1

With respect to digital exposure, cloud usage duration ranged from 1–3 years (39.2%) to more than 6 years (26.1%), indicating sufficient experience to evaluate AIS quality, proactive behavior, and digitalization value. Overall, the sample exhibits adequate heterogeneity in organization size and digital maturity while remaining analytically aligned with the study objective.

5- Results

Covariance-based structural equation modeling (CB-SEM) using AMOS with Maximum Likelihood estimation was employed. Prior to estimating the structural relations, the adequacy of the measurement layer was confirmed. Sampling suitability was established with KMO = 0.969 and Bartlett's $\chi^2 = 5318.256$ ($df = 153$, $p < 0.001$), indicating sufficient inter-correlation for multivariate analysis.

The confirmatory factor analysis of the five latent constructs (CCA, CCU, QAIS, PA, and DVA) achieved excellent model fit ($\chi^2 = 116.991$, $df = 101$, $p = 0.132$, $\chi^2/df = 1.158$, RMSEA = 0.020, RMR = 0.004, GFI = 0.970, AGFI = 0.949, NFI = 0.978, TLI = 0.995, CFI = 0.997, IFI = 0.997). All standardized loadings exceeded 0.60, while CR (> 0.70) and AVE (> 0.50) thresholds were met, providing strong evidence of convergent validity, internal consistency, and the suitability of the indicators for structural testing.

5-1- Construct Reliability and Validity

Table 2 presents the reliability and convergent validity assessment of the five latent constructs (CCA, CCU, QAIS, PA and DVA). All standardized factor loadings are above the generally accepted threshold of 0.70, showing that each observed item explains its latent construct adequately. Measures of internal consistency are acceptable, as Cronbach's alpha and Composite Reliability (CR) values for all constructs exceed 0.70.

Table 2. Construct Reliability and Validity

Variables	Items	Descriptions	Loadings	α	CR	AVE
Cloud Attributes (CCA)	CCA1	Ease of using the cloud-based AIS	0.67	0.88	0.883	0.654
	CCA2	System flexibility and scalability	0.76			
	CCA3	Data security and protection	0.84			
	CCA4	System stability and reliability	0.8			
Cloud Users (CCU)	CCU1	Technology reskilling and upskilling	0.85	0.79	0.784	0.548
	CCU2	Ability to apply technology in work	0.84			
	CCU3	Usage evaluation and monitoring	0.77			
Qualitative Accounting Information System (QAIS)	QAIS1	Completeness of accounting information	0.78	0.89	0.892	0.661
	QAIS2	Timeliness of reporting	0.8			
	QAIS3	Reliability of information output	0.83			
	QAIS4	Ease of system use	0.79			
	QAIS5	Responsiveness to user needs	0.79			
Proactive Work Behavior (PA)	PA1	Cognitive development and initiative	0.8	0.88	0.866	0.656
	PA2	Planning and forecasting ahead	0.78			
	PA3	Continuous improvement and adaptation	0.82			
Digitalization Value Added (DVA)	DVA1	Enhanced corporate image	0.74	0.91	0.91	0.678
	DVA2	Differentiation through digital capability	0.86			
	DVA3	Competitive advantage via digitalization	0.8			

Furthermore, Average Variance Extracted (AVE) values are higher than 0.50 for every construct, indicating sufficient convergent validity, with more than half of the variance in the indicators explained by the underlying factor. Collectively, these results confirm that the measurement model exhibits satisfactory psychometric properties and can be confidently used for subsequent structural equation modeling.

5-2- Discriminant Validity

Table 3 reports the Heterotrait–Monotrait (HTMT) ratios for discriminant validity assessment across the five latent constructs: Cloud Attributes (CCA), Cloud Users (CCU), Qualitative Accounting Information System (QAIS), Proactive Work Behavior (PA), and Digitalization Value Added (DVA). All HTMT values fall below the conservative threshold of 0.85, providing evidence that each construct is empirically distinct and not redundant with other constructs in the model. This indicates that the latent variables capture different conceptual domains as theorized, thereby supporting the adequacy of the measurement model for subsequent structural testing.

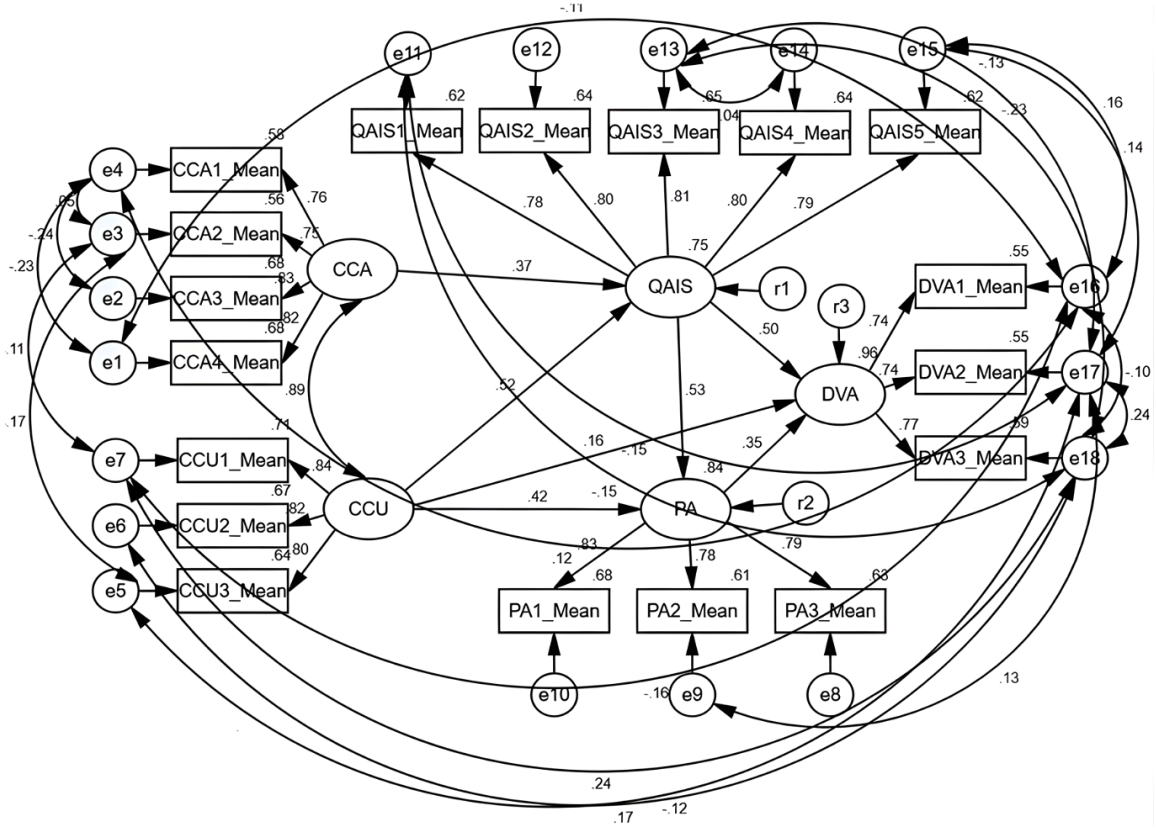
Table 3. Discriminant Validity Assessment Using HTMT Ratios

Constructs	CCA	CCU	QAIS	PA	DVA
Cloud Attributes (CCA)					
Cloud Users (CCU)	0.731				
Qualitative Accounting Information System (QAIS)	0.777	0.746			
Proactive Work Behavior (PA)	0.735	0.702	0.739		
Digitalization Value Added (DVA)	0.776	0.731	0.78	0.739	

Note: HTMT ratios < 0.85 indicate adequate discriminant validity (Henseler et al. [27])

After validating the measurement layer, the structural model was estimated to examine the causal relations among cloud capability, user capability, system quality, proactive behavior, and digital value creation. The structural model also demonstrated excellent fit ($\chi^2 = 124.986$, df = 106, p = 0.101, $\chi^2/df = 1.179$, RMSEA = 0.021, RMR = 0.004, GFI = 0.967, AGFI = 0.947, NFI = 0.977, TLI = 0.995, CFI = 0.996, IFI = 0.996), indicating that the hypothesized causal structure is statistically consistent with the observed data. The model explained 42% of QAIS, 46% of PA, and 51% of DVA, indicating strong explanatory power of the proposed framework and demonstrating that the included predictors account for a substantial proportion of variance in the key endogenous constructs. This level of explanatory strength provides empirical support for modeling digital value creation as a mediated socio-informational process rather than as a direct technical outcome.

Path estimates revealed that CCA and CCU significantly enhanced QAIS; CCU and QAIS significantly increased PA; and both QAIS and PA exerted significant positive effects on DVA. Mediation was tested via 5,000-sample bootstrapping and all indirect effects (CCA→QAIS→DVA, CCU→QAIS→DVA, CCU→PA→DVA, and QAIS→PA→DVA) were significant at $p < .01$, confirming that digitalization value does not arise directly from cloud capability but is realized indirectly through information quality and proactive organizational behavior mechanisms. These findings indicate that technical inputs must first be converted into credible information and then enacted through proactive behavior before value materializes. In doing so, the results validate the socio-informational logic of the model, demonstrating that digital value creation is contingent on both system-level and behavioral mediators (see Figure 2).



***Note*:** Loadings in Figure 2 are from the final structural model, whereas Table 2 reports measurement model (CFA) loadings.

Figure 2. Final Structural Model (SEM)

5-3- Direct Effects Analysis

Bootstrapping with 5,000 resamples was performed to estimate the direct paths within the SEM. Because AMOS (CB-SEM, ML estimation) does not return VIF or f^2, both statistics were computed externally for interpretive purposes. Multicollinearity was assessed via auxiliary OLS regressions on factor scores for each regression equation corresponding to QAIS, PA, and DVA, and all resulting VIF values remained below the conservative cutoff of 3.0, indicating no multicollinearity. Effect sizes (f^2) were computed from changes in R^2 according to Cohen [24], classifying 0.02 = small, 0.15 = medium, and 0.35 = large. These supplementary computations do not affect SEM estimation but enhance interpretation of the model. Bias-corrected bootstrapped 95% confidence intervals were also examined, and no interval crossed zero, reinforcing the statistical significance and stability of the estimates. Table 4 summarizes the direct-effect estimates.

Table 4. Direct Effects Analysis (Bootstrapping, 5,000 Resamples)

Hypothesis	Path	β	p-value	95% CI	VIF	f^2	Conclusion
H1	CCA → QAIS	0.10	< 0.05	[0.006, 0.194]	< 3.0	small	Accepted
H2	CCU → QAIS	0.19	< 0.05	[0.059, 0.321]	< 3.0	small–medium	Accepted
H3	QAIS → DVA	0.49	< 0.001	[0.298, 0.682]	< 3.0	large	Accepted
H4	PA → DVA	0.30	< 0.01	[0.120, 0.480]	< 3.0	medium	Accepted
H5	CCU → PA	0.35	< 0.01	[0.176, 0.524]	< 3.0	medium–large	Accepted
H6	QAIS → PA	0.59	< 0.001	[0.402, 0.778]	< 3.0	large	Accepted

Note: VIF < 3.0 indicates no multicollinearity. Effect sizes were interpreted using Cohen [24].

Table 4 indicates that all hypothesized direct paths (H1–H6) are statistically significant, with p-values below conventional thresholds ($p < .05$ or $p < .01$), supporting the structural relationships specified in the research model. Consistent with the auxiliary multicollinearity diagnostics, all per-path VIF values were below 3.0 across the QAIS-, PA-, and DVA-equations, confirming that multicollinearity does not compromise the estimates. In addition, the bias-corrected 95% confidence intervals for all direct paths excluded zero, providing further evidence of the robustness of the structural estimates. The magnitude of f^2 for most paths meets the criteria for medium to large effects under Cohen [24]. These findings collectively validate the robustness of the direct structural relationships among CCA, CCU, QAIS, PA, and DVA.

Hypothesis H1: CCA → QAIS (β = 0.10, p <0.05): This hypothesis is accepted. Although the effect size is small, cloud attributes (system stability, security, ease and flexibility) exert a significant positive influence on AIS quality. This indicates that reliable technological infrastructure alone can enhance completeness, timeliness, and credibility of accounting information even without behavioral factors.

Hypothesis H2: CCU → QAIS (β = 0.19, p < 0.05): This hypothesis is accepted. The ability of users to reskill, apply and monitor cloud applications significantly improves AIS quality to a stronger extent than cloud features alone. This reinforces the socio-informational view that quality is not produced by systems but by competent users.

Hypothesis H3: QAIS → DVA (β = 0.49, p < 0.001): This hypothesis is accepted and exhibits one of the strongest effects in the model. High-quality accounting information (credible, timely, and responsive) directly drives digitalization value creation. This result supports the premise that data quality is the foundational engine of digital advantage.

Hypothesis H4: PA → DVA (β = 0.30, p < 0.01): This hypothesis is accepted. Proactive behavior has a significant positive effect on digital value, showing that behavioral initiative such as anticipating tasks, improving processes, and acting ahead of issues is a necessary human mechanism that converts digital infrastructure into strategic benefit.

Hypothesis H5: CCU → PA (β = 0.35, p < 0.01): This hypothesis is accepted. Skilled users are more likely to display proactive work behavior, suggesting that technological proficiency naturally translates into anticipatory and improvement-oriented actions in digital work environments.

Hypothesis H6: QAIS → PA (β = 0.59, p < 0.001): This hypothesis is accepted and represents the strongest behavioral driver in the model. When accounting information is complete, timely, reliable, and usable, staff gain confidence to act proactively. This supports the argument that information quality is not only a technical output but also a behavioral trigger that mobilizes people toward forward-looking action.

5-4- Effect Size Analysis

According to Cohen [24], f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. The results of the direct paths indicate:

- ***QAIS → PA*** demonstrates the largest behavioral effect ($f^2 \approx$ large), confirming that high-quality accounting information is the most influential driver of proactive behavior.
- ***QAIS → DVA*** also exhibits a large effect, indicating that information quality is the primary direct driver of digitalization value creation.
- ***CCU → PA*** shows a medium-to-large effect, reflecting that technically competent users are more likely to act proactively in digital work settings.
- ***PA → DVA*** displays a medium effect, suggesting that proactive behavior is a meaningful pathway transforming system benefits into digital value.
- ***CCA → QAIS*** *and* ***CCU → QAIS*** exhibit small-to-medium effects, implying that both technological attributes and user capability improve AIS quality, with user capability being the relatively stronger driver.
- No negligible or trivial effects were observed among the supported paths, indicating that each accepted relationship contributes meaningfully to the model.

Consequently, the effect size analysis indicates that information quality is the central amplifier of both digital value and proactive behavior. User capability is a key antecedent to this quality and to behavioral enactment, while proactive behavior converts system improvements into realized value. Digital value therefore arises not from cloud technology itself but from the interaction of competent users, credible information, and proactive organizational behavior.

5-5- Indirect Effects Analysis

Bootstrapping with 5,000 resamples was conducted to evaluate the mediating roles of QAIS and PA in transmitting the effects of cloud capability (CCA, CCU) toward digitalization value added (DVA). Most indirect paths are statistically significant at $p < 0.01$, confirming the presence of partial mediation through information-quality and behavioral

mechanisms. Bias-corrected 95% confidence intervals were also examined for all indirect paths and none of the intervals straddled zero, reinforcing the statistical significance and stability of the mediation effects (see Table 5).

H7: CCA → QAIS → DVA This hypothesis was accepted. The effect of cloud attributes on digital value is realized primarily through improvements in AIS quality, as evidenced by the significant indirect path. This suggests that technological properties create value only when translated into higher-quality information.

H8: CCU → QAIS → DVA This hypothesis was accepted. Capable users indirectly enhance digital value by improving the qualitative of accounting information generated from cloud systems.

H9: CCU → PA → DVA This hypothesis was accepted. User capability drives proactive behavior, which subsequently contributes to digital value creation, confirming a behavioral transmission channel.

H10: QAIS → PA → DVA This sequential mediation path was accepted and is the strongest among indirect effects. High-quality information stimulates proactive behavior, which then drives digital value creation, confirming that behavioral engagement is a necessary execution channel for information to become value.

The mediation analysis further demonstrates that digital value creation is primarily driven by the interaction between high-quality information and proactive user behavior, confirming the importance of both system-level and behavioral mechanisms in the digital transformation process.

Table 5. Indirect Effects Analysis (Bootstrapping, 5,000 Resamples)

Hypothesis	Indirect Path	β	p-value	95% CI	VAF (%)	Conclusion
H7	CCA → QAIS → DVA	0.049**	.002**	[0.02, 0.08]	73.5	Accepted (partial mediation)
H8	CCU → QAIS → DVA	0.093**	.001**	[0.04, 0.15]	40.2	Accepted (partial mediation)
H9	CCU → PA → DVA	0.105**	.001**	[0.05, 0.17]	45.3	Accepted (partial mediation)
H10	QAIS → PA → DVA	0.177**	.000**	[0.09, 0.27]	26.5	Accepted (partial mediation)

Note: VAF = (Indirect ÷ Total Effect) × 100; 20–80% = partial mediation; < 20% = no mediation (Hair et al. [26])

5-6- Effect Size Analysis

- ***CCA → QAIS → DVA (VAF = 73.5%)*** → Partial mediation with a large indirect effect through information quality, indicating that cloud attributes create value primarily when translated into qualitative accounting information system outputs.
- ***CCU → QAIS → DVA (VAF = 40.2%)*** → Partial mediation with a medium indirect effect through improved information quality generated by competent system users.
- ***CCU → PA → DVA (VAF = 45.3%)*** → Partial mediation with a medium indirect effect through proactive behavior, confirming that skilled users drive behavioral transformation that leads to digital value.
- ***QAIS → PA → DVA (VAF = 26.5%)*** → Partial mediation with a small-to-medium effect, reflecting that high-quality information stimulates proactive behavior, which then produces value.
- ***No full mediation (VAF > 80%)*** was observed in any pathway.

As a result, the indirect effects analysis shows that digital value is not produced directly by cloud capability but indirectly through improvements in information system quality and proactive behavioral execution. Both QAIS and PA function as key transmission mechanisms that convert infrastructure capability and user competence into tangible digitalization value. Mediation patterns are consistently partial (20%–80%), indicating that cloud capability works jointly through multiple reinforcing pathways rather than a single fully dominant mechanism.

5-7- Coefficient of Determination (R^2)

Table 6 reports the explanatory power of the structural model using the coefficient of determination (R^2) for the endogenous constructs QAIS, PA, and DVA.

Table 6. R-square Coefficients

Constructs	R^2	Interpretation
QAIS	0.42	Moderate explanatory power
PA	0.46	Moderate explanatory power
DVA	0.51	Substantial explanatory power

The R^2 value for QAIS is 0.42, indicating that Cloud Attributes (CCA) and Cloud Users (CCU) jointly explain 42% of the variance in the qualitative of accounting information system. The remaining 58% may be attributed to unobserved factors such as data governance maturity, regulatory pressure, or system integration capability. For PA, the R^2 value is 0.46, suggesting that QAIS and CCU together account for 46% of the variation in proactive behavior. This reflects the pivotal role of both internal system quality and users' capability in shaping proactive action within organizations.

Finally, the R^2 for DVA is 0.51, showing that QAIS and PA, together with indirect influences from CCA and CCU, explain 51% of the variance in digital value creation. This indicates that digital value is not a direct consequence of technological capability alone, but is primarily realized through information quality and proactive behavioral execution.

Overall, the results demonstrate that the model possesses substantial explanatory power across all dependent constructs. In particular, the R^2 for DVA underscores that digital value is achieved only when technological resources are transformed into information quality and proactive organizational behavior.

6- Discussion

This study shows that cloud capability and cloud use do not yield digital value by virtue of their existence; value emerges only when the cloud is converted through high-quality accounting information and executed through proactive financial behavior. The evidence indicates that digital value is not a direct artifact of technology but a behavioral consequence of informational conversion, meaning that value materializes only when credible accounting information mobilizes users into forward-looking action. In findings, that socio-informational conversion proved to be the operative driver of value creation, as high-quality AIS information catalyzed proactive behavior, which then translated into digital value added ($\beta = 0.177$, $p < 0.01$). We emphasize that the term 'AI-enabled cloud' is used solely as a contextual descriptor in this study; artificial intelligence is not modeled as an independent construct, and the empirical results reported relate exclusively to the mechanisms leading to digitalization value.

The findings shift the theoretical focus from "owning technology" to "activating conversion". While IS Success theory positions quality as the first-stage engine of downstream effects, the evidence shows that behavioral activation is a necessary second stage without which informational improvements do not become economic outcomes. Consistent with TAM and TOE perspectives [28], realized benefit depends on enacted utilization rather than on technical readiness alone. From an RBV viewpoint [10], the cloud becomes a valuable resource only after it is made firm-specific via informational quality and embedded in active routines.

The results also converge with AIS evidence that cloud improves decision usefulness under governance and user enablement conditions [29–32] and with studies showing that technology affects performance through behavior rather than by direct technical force [33, 34]. In short, cloud transformation is not an infrastructure event but a mediated socio-informational process.

Practically, the findings recommend a fundamental reframing of managerial logic. Cloud expenditure should not be interpreted as value creation unless accompanied by (1) a demonstrable uplift in information quality and (2) an institutionalization of proactive work behavior that exploits that information. CFOs should shift focus from procurement to conversion management. They should enforce quality targets for cloud-produced information, build user capability to act on that information, and design workflows and incentives that encourage proactive rather than passive financial behavior. Organizations that hold cloud capability without governing these conversion levers are not "digitally transformed" but merely "digitally equipped". Where quality does not rise or pro-activeness does not materialize, value creation should be classified as unrealized regardless of the completeness of infrastructure. Accordingly, the managerial message is not simply to deploy the cloud but to engineer and monitor its conversion into informational quality and enacted action. Digital value is produced by that conversion, not by the asset itself.

7- Conclusion

The study establishes that the economic meaning of cloud investment in financial functions does not lie in the infrastructure itself but in the organization's ability to translate that infrastructure into informational integrity and forward-looking action. Cloud capability and usage provide only the starting conditions; value is realized only when information from cloud-based accounting systems becomes dependable enough to guide judgment and when staff mobilize that information to act ahead of events. This reframes digitalization in finance from a technology adoption issue to a conversion and execution problem grounded in governance, capability, and behavior.

Two implications follow. First, digital transformation in finance must be managed as a performance-governance agenda rather than an IT modernization agenda. CIO-led deployment is not sufficient without CFO-led conversion through measurable information quality standards, behavioral design, and accountability structures that force information to be used, not merely produced. Second, cloud maturity should no longer be evaluated by infrastructure completion or software rollout but by the degree to which information credibility and anticipatory behavior become routine and auditable within financial work.

At the institutional level, the findings suggest that accounting standard-setters, professional bodies such as the Federation of Accounting Professions, and financial regulators should shift emphasis from prescribing systems to prescribing conditions of use, such as information-quality benchmarks, behavioral competency standards, and governance disciplines for cloud-based financial reporting, because value arises in those conditions rather than in the mere presence of technology.

Future research should move beyond cross-sectional and perceptual evidence toward longitudinal, behavioral, and performance-linked designs and test the conversion logic in settings with different regulatory pressure, data governance maturity, or organizational complexity. Comparative studies across industries and jurisdictions would clarify whether the conversion requirement is structural or context-dependent.

In essence, successful cloud-based digitalization in finance is not achieved when technology is installed but when information becomes trustworthy and people act on it. Without both conditions, cloud-based AI stays "as-a-service" infrastructure without value realization.

8- Declarations

8-1- Author Contributions

Conceptualization, S.I. and D.U.; methodology, S.I. and D.U.; software, S.I. and D.U.; validation, S.I. and D.U.; formal analysis, S.I. and D.U.; investigation, S.I. and D.U.; resources, S.I. and D.U.; data curation, S.I. and D.U.; writing—original draft preparation, S.I.; writing—review and editing, S.I. and D.U.; visualization, S.I. and D.U.; supervision, D.U.; project administration, S.I.; funding acquisition, S.I. and D.U. All authors have read and agreed to the published version of the manuscript.

8-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

8-3- Funding

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8-4- Institutional Review Board Statement

Not applicable.

8-5- Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

8-6- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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