INFORMATION TECHNOLOGY ADOPTION AND FINANCIAL REPORTING QUALITY IN VIETNAMESE TRADING AND SERVICE FIRMS: A HIGHER-ORDER PLS-SEM APPROACH

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***Abstract:** This study examines the impact of information technology adoption on financial reporting quality in Vietnamese trading and service firms and disaggregates that impact across the qualitative characteristics of useful financial information. Data comprise 300 valid questionnaires (out of 798 distributed) from accounting and auditing practitioners who directly prepare or review financial statements. The research model draws on the Information Systems Success Model, the Technology Acceptance Model and decision-usefulness theory. Both information technology adoption and financial reporting quality are specified as higher-order constructs measured by global indicators, and the model is estimated by PLS-SEM with 5,000 bootstrap samples and bias-corrected and accelerated confidence intervals. The findings indicate that (i) information technology adoption significantly improves financial reporting quality; (ii) this impact is significant for reliability, comparability and relevance but insignificant for understandability; and (iii) the effect on relevance operates entirely through overall financial reporting quality. Based on these findings, several recommendations are proposed to improve financial reporting quality in the context of digital transformation in Vietnam.*

Keywords: *Financial reporting quality, information technology, higher-order constructs, PLS-SEM, trading and service firms.*

1. Introduction

Financial statements are the primary channel through which a reporting entity communicates its financial position and performance to capital providers; when this channel is noisy, capital is misallocated and contracting costs rise. Trading and service firms constitute the largest sector group in the Vietnamese economy: as of 31 December 2023, the country had nearly 921,400 operating enterprises, of which the service sector accounted for more than 628,000, or 68.2% (General Statistics Office, 2024). This sector group is characterised by high transaction volumes, low value per transaction and dispersed networks of points of sale. The mandatory adoption of e-invoices under Decree No. 123/2020/ND-CP and Decree No. 70/2025/ND-CP has fundamentally changed how accounting data are generated: transactions are now recorded automatically at the point of sale rather than re-keyed from paper documents.

Most existing studies measure information technology in binary terms and treat financial reporting quality as a unidimensional index, which cannot reveal which aspects of technology create value and which quality characteristics technology improves. This study models information technology adoption as a second-order construct comprising three components, tests its effects on each quality characteristic rather than only on a composite index, and provides evidence from the trading and service sector of an economy undergoing rapid digital transformation.

2. Literature review and hypothesis development

2.1. Research constructs and research gap

Accrual-based earnings quality proxies require long time series and data on listed companies and are therefore not feasible for Vietnamese trading and service firms, most of which are unlisted. This study therefore adopts an approach based on the qualitative characteristics set out in the IASB (2018) Conceptual Framework, following the direction initiated by van Beest et al. (2009) and already applied in Vietnam (Pham et al., 2022). Financial reporting quality is defined as the extent to which the information in financial statements meets the qualitative characteristics of useful financial information, as assessed by the preparers and reviewers of the financial statements, comprising relevance (REL), reliability (RLB), comparability (CMP) and understandability (UND).

Information technology adoption is understood as the extent to which a firm exploits technological resources

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to support the collection, processing, storage and communication of accounting information, building on Bharadwaj's (2000) view that technology is a bundle of capabilities rather than a single asset. Three first-order components are proposed: data and information processing (DIP) reflects the capability of recording transactions at source, automating recurring journal entries and consolidating data from multiple transaction points; electronization of management systems and work processes (EWP) reflects the extent to which authorisation workflows, the flow of source documents and access controls run on electronic platforms; and utilisation of advances in information technology (UAT) reflects the capacity to absorb emerging technologies.

In Vietnam, Ngo Thi Thu Huong (2025), surveying accountants and auditors of listed companies, finds that information technology is the third most influential factor in the quality of financial statement information, after accountants' competence and internal control. However, domestic studies stop at aggregate information quality; no study has yet tested all four qualitative characteristics simultaneously within a single model.

2.2. Theoretical background and research hypotheses

The study draws on three foundations. The Information Systems Success Model (DeLone & McLean, 2003) positions information quality as an outcome driven by system quality – the direct basis for H1. The Technology Acceptance Model (Davis, 1989) adds that technology creates value only when it is used substantively – the basis for treating UAT as a separate component. Decision-usefulness theory (IASB, 2018) holds that the qualitative characteristics are distinct dimensions with different formation mechanisms.

The relationship between technology and financial reporting quality operates through three channels: reducing transaction processing errors, shortening the period-end close and strengthening the audit trail. In the trading and service sector, all three channels carry considerable weight; yet the same features create a countervailing risk, as a single misconfiguration can propagate across the entire network of points of sale, so which direction dominates is an empirical question.

H1: Information technology adoption has a positive effect on the financial reporting quality of trading and service firms.

Because the four qualitative characteristics have different formation mechanisms (IASB, 2018), a single input factor need not affect all four equally, and the international evidence for each characteristic is very unevenly distributed – the basis for separating the H2 group.

Relevance comprises predictive value, confirmatory value and timeliness – all of which depend on the speed and scope of data processing. The evidence here is strongest: Brazel & Dang (2008) show that US firms significantly shortened the lag between fiscal year-end and the earnings release date after implementing enterprise resource planning (ERP) systems. In the trading and service sector, where manual bookkeeping cannot cope with daily transaction volumes, this mechanism is expected to operate clearly.

H2a: Information technology adoption has a positive effect on the relevance of information presented in the financial statements of trading and service firms.

Reliability encompasses faithful representation, neutrality, completeness and verifiability, and the evidence here is mixed. Masli et al. (2010) show that internal control monitoring technology is associated with a lower likelihood of material weaknesses, lower audit fees and shorter audit report lags. Conversely, Brazel & Dang (2008) document that discretionary accruals increased after ERP implementation, implying that technology simultaneously widens management's discretion over reported figures. Technology therefore strengthens the technical attributes of reliability but does not eliminate incentives for earnings management.

H2b: Information technology adoption has a positive effect on the reliability of information presented in the financial statements of trading and service firms.

Comparability depends on the consistent application of accounting policies across reporting periods and across segments of the same entity. Dhole et al. (2015) show that the SEC's XBRL mandate increased financial statement comparability: a uniformly applied technical standard enforces consistency. The same mechanism operates within the firm, as a centralised system forces all points of sale and branches to use common product master data, the same revenue recognition policies and the same inventory costing method.

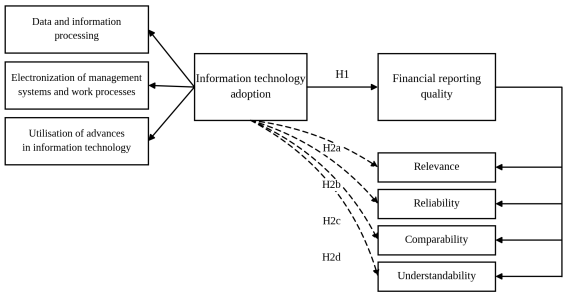
H2c: Information technology adoption has a positive effect on the comparability of information presented in the financial statements of trading and service firms.

Understandability depends on how information is classified, characterised, presented and disclosed – the characteristic for which the existing literature has found almost no role for technology. Lo et al. (2017) show that firms with signs of earnings management tend to issue

less readable annual reports, implying that understandability reflects the preparer's intent rather than technological infrastructure. The authors nonetheless state H2d in the positive direction to preserve symmetry, but expect its magnitude to be the smallest of the four characteristics and do not rule out that it fails to reach statistical significance.

H2d: Information technology adoption has a positive effect on the understandability of information presented in the financial statements of trading and service firms.

Figure 1: Proposed research model



Note: Information technology adoption (ITG) is a reflective–reflective second-order construct, with arrows running from the construct to its three components. Financial reporting quality (FRQ) is measured by global indicators, and the four characteristics are specified as its reflective manifestations. Dashed lines denote hypotheses H2a–H2d.

Source: Proposed by the authors.

The number of observed variables is: DIP (5), EWP (4), UAT (4), REL (5), RLB (5), CMP (5) and UND (5); ITG and FRQ are each measured by three global indicators.

3. Research methodology

3.1. Data collection

A quantitative questionnaire survey was administered to chief accountants, heads of accounting, general ledger accountants, staff accountants and auditors who directly prepare or review financial statements at trading and service firms in Vietnam. The survey was distributed in person, by post, by email, online (Google Docs) and through other channels. A total of 521 responses were returned out of 798 questionnaires distributed, a response rate of 65.29%. After excluding questionnaires with many blank items or incomplete information, 300 valid responses were retained (37.59%). The questionnaire includes four screening questions at the beginning and one attention-check item in the middle; all 300 responses met the screening criteria, contained no missing data and showed no straight-lining. Using the inverse square root method (Kock & Hadaya, 2018), the minimum required sample size is approximately 275 observations; the sample of 300 is therefore adequate.

Wholesale and retail trade accounts for 38.0% of the sample, transport and storage for 19.7%, and accommodation and food services for 17.0%; 68.7% of respondents hold a university degree and 58.4% hold the position of general ledger accountant or above. Regarding their employers, 71.0% operate at two or more business locations, 58.7% have their financial statements audited by independent auditors, and firms with fewer than 50 employees account for 53.6%. The level of technology adoption varies widely: 6.7% still process manually, 44.7% use stand-alone software, 26.3% use integrated sales–inventory software, and 21.0% have implemented ERP systems.

3.2. Data analysis

Both focal constructs are specified as higher-order constructs measured with global indicators. Information technology adoption (ITG) is measured directly by three global indicators, while DIP, EWP and UAT are positioned as endogenous constructs reflecting this common construct. Similarly, financial reporting quality (FRQ) is measured by three global indicators, and REL, RLB, CMP and UND are its reflective manifestations. This specification allows the effect of technology on overall financial reporting quality (H1) and on each characteristic (H2a–H2d) to be tested simultaneously, with the effect on each characteristic decomposed into a direct component and an indirect component via FRQ.

In the preliminary stage, SPSS was used to assess reliability and conduct exploratory factor analysis. The main stage used PLS-SEM in SmartPLS 4 because the model contains higher-order constructs and Likert-scale data typically violate multivariate normality (Hair et al., 2019). Higher-order constructs were specified following Sarstedt et al. (2019), and HTMT served as the decisive criterion for discriminant validity. The structural model was evaluated through path coefficients, R^2 and f^2, using 5,000 bootstrap samples, bias-corrected and accelerated (BCa) confidence intervals and two-tailed tests at the 5% level. Common method bias was controlled through respondent anonymity and buffer items (Podsakoff et al., 2003), combined with Harman's test, the full collinearity test (Kock, 2015) and the marker variable technique.

4. Results

4.1. Measurement model assessment

Construct means range from 3.587 to 3.672 with standard deviations of 0.585–0.757; skewness and kurtosis of all observed variables lie within ±1. In the first round of reliability assessment, five items with negative or near-zero corrected item–total correlations (DIP5, EWP2, UAT3, REL2 and RLB1) were removed. Exploratory factor analysis on the remaining 28 items yielded KMO = 0.908 and a significant Bartlett's test (χ^2 = 4,409.140; df = 378; p < 0.001), explaining 70.014% of total variance with factor loadings of 0.662–0.856.

As shown in Table 1, outer loadings range from 0.707 to 0.954, all exceeding the 0.708 threshold and significant at the 0.1% level. Cronbach's alpha ranges from 0.788 to 0.886, composite reliability (CR) from 0.876 to 0.918 and average variance extracted (AVE) from 0.624 to 0.789, all meeting the thresholds, with no value exceeding 0.95.

Table 1: Measurement model assessment results

Construct	Items	Loading range	Cronbach's α	CR	AVE	R^2
IT adoption (ITG)	3	0.879 – 0.904	0.866	0.918	0.789	–
Data and information processing (DIP)	4	0.848 – 0.862	0.879	0.917	0.734	0.494
Electronization of management and processes (EWP)	3	0.865 – 0.886	0.844	0.906	0.762	0.443
Utilisation of technological advances (UAT)	3	0.824 – 0.846	0.788	0.876	0.702	0.506
Financial reporting quality (FRQ)	3	0.875 – 0.885	0.852	0.910	0.772	0.286
Relevance (REL)	4	0.825 – 0.846	0.858	0.904	0.702	0.507
Reliability (RLB)	4	0.769 – 0.836	0.820	0.882	0.651	0.463
Comparability (CMP)	5	0.780 – 0.807	0.857	0.897	0.636	0.440
Understandability (UND)	5	0.707 – 0.954	0.886	0.891	0.624	0.008

Note: All outer loadings are significant at the 0.1% level (5,000 bootstrap samples, BCa). The loading range of UND is unusually wide because this block is nearly orthogonal to all other constructs, so its outer weights are not stably identified.

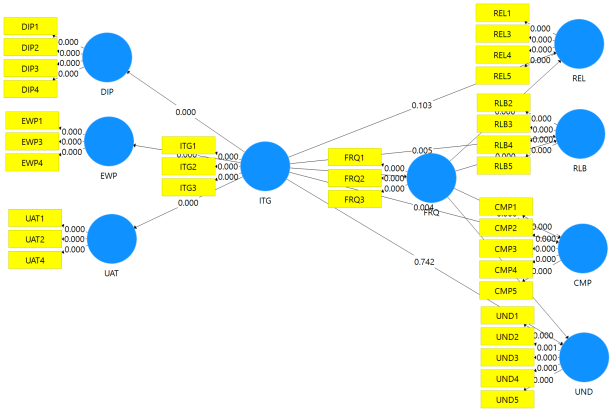
Source: Authors' analysis of survey data.

Regarding discriminant validity, HTMT ratios among the financial reporting quality constructs and among the technology components are all below 0.85, the highest being 0.774 between DIP and UAT. Two pairs show higher values – UAT with ITG (0.859) and REL with FRQ (0.827) – which is expected because ITG and FRQ are higher-order constructs that share conceptual content with their own components. The Fornell–Larcker criterion is also satisfied, with the square roots of AVE ranging from 0.790 to 0.888.

4.2. Structural model assessment and hypothesis testing

The structural model was estimated using the PLS algorithm with the path weighting scheme; the results are illustrated in Figure 2 and detailed in Table 2.

Figure 2: Structural model estimation results



Note: Values on the paths are p-values obtained from 5,000 bootstrap samples.

Source: Authors' analysis of survey data.

Information technology adoption explains 49.4% of the variance in DIP, 44.3% in EWP and 50.6% in UAT. The corresponding path coefficients are 0.703, 0.665 and 0.712, all significant at the 0.1% level, confirming that the three components jointly reflect a common construct and contribute almost equally.

Hypothesis H1 is supported. Information technology adoption has a positive and highly significant effect on financial reporting quality (β = 0.535; t = 13.244; p < 0.001), explaining 28.6% of its variance.

The H2 hypotheses yield clearly differentiated results. Because FRQ acts as a mediator, H2a–H2d are tested on the total effect, i.e., the sum of the direct effect and the indirect effect via FRQ, and the type of mediation is classified following Zhao et al. (2010). Information technology adoption has a significant total effect on reliability (β = 0.459), comparability (β = 0.448) and relevance (β = 0.438), all at p < 0.001; H2a, H2b and H2c are therefore supported. In contrast, the effect on understandability is non-significant for all three components – direct, indirect and total – so H2d is rejected. The model explains only 0.8% of the variance in understandability, compared with 50.7%, 46.3% and 44.0% for the other three characteristics.

Table 2: Hypothesis testing and mediation analysis results

H	Path	Direct	Indirect	Total	Conclusion
H1	ITG → FRQ	0.535***	–	0.535***	Supported
H2a	ITG → REL	0.082	0.356***	0.438***	Supported
H2b	ITG → RLB	0.140**	0.318***	0.459***	Supported
H2c	ITG → CMP	0.138**	0.310***	0.448***	Supported
H2d	ITG → UND	–0.039	–0.032	–0.071	Rejected

*Note: * $p < 0.001$; $p < 0.01$; unmarked coefficients are not significant. Exact p-values of the direct paths: H2a = 0.103; H2b = 0.005; H2c = 0.004; H2d = 0.742. 95% BCa confidence intervals of the indirect effects: H2a [0.287; 0.432]; H2b [0.248; 0.391]; H2c [0.241; 0.378]; H2d [–0.113; 0.115]. Following Zhao et al. (2010), H2a represents full mediation, H2b and H2c represent complementary partial mediation, and H2d shows no effect.*

Source: Authors' analysis of survey data.

Separating direct from indirect effects reveals different transmission mechanisms. For relevance, the direct effect is not significant ($\beta = 0.082$; $p = 0.103$), whereas the indirect effect is strong and highly significant ($\beta = 0.356$; $p < 0.001$; BCa confidence interval [0.287; 0.432]). This is full mediation: information technology does not improve relevance through any separate channel; its entire influence operates by raising overall financial reporting quality. For reliability and comparability, both the direct and indirect effects are significant and share the same sign, i.e., complementary partial mediation: in addition to the common channel, technology exerts a separate effect on these two characteristics. However, the direct coefficients are only 0.138–0.140, with effect sizes f^2 of 0.024 and 0.026 respectively, around the small-effect threshold; the separate channel exists but is much weaker than the common channel.

4.3. Controlling for common method bias

All three tests yield favourable results: the first factor in Harman's test explains 29.80% of total variance, below the 50% threshold; full collinearity variance inflation factors range from 1.017 to 3.219, below the 3.3 threshold; and the three marker variables built into the questionnaire correlate with the study constructs at only $|r| \leq 0.123$. The marker variable test, which is more powerful than the first two, provides direct evidence that no common method factor is large enough to bias the estimated coefficients.

5. Discussion

The support for H1 confirms the central prediction of DeLone & McLean (2003) and is consistent with Ngo Thi Thu Huong (2025). However, the coefficient of 0.535 should be read together with the R^2 of 28.6%: more than seven-tenths of the variation in financial reporting quality lies outside the scope of technology. The argument that digitalisation will automatically improve the quality of accounting information is therefore supported in sign but not in magnitude; the unexplained variance most likely relates to compliance with accounting standards, the effectiveness of internal control and the professional competence of accounting staff (Pham et al., 2022; Ngo Thi Thu Huong, 2025). The three path coefficients from the technology construct to its components differ only within 0.665–0.712, supporting Bharadwaj's (2000) view that the value of technology lies in the bundle of capabilities rather than in any single component.

The ranking of effects across the four characteristics does not match the order suggested by the international literature. Evidence on relevance is the strongest in the literature (Brazel & Dang, 2008), yet in this sample H2a has the lowest total coefficient of the three supported hypotheses and no direct effect at all. This reversal may reflect contextual differences: prior studies used US listed firms, where timeliness is already high and the room for improvement is narrow. Conversely, reliability and comparability are the only two characteristics that retain a significant direct effect after controlling for overall financial reporting quality, consistent with the standardisation-enforcement mechanism documented by Dhole et al. (2015) and the role of internal control monitoring technology identified by Masli et al. (2010). The sample characteristics reinforce this interpretation, as 71.0% of the firms operate at two or more business locations.

For understandability, the expectation stated when formulating H2d is confirmed more strongly than anticipated: the effect is not merely the smallest but entirely absent. Non-significant direct and total coefficients and an R^2 of only 0.008 are too consistent to be attributed to random error, and because the UND block has very high internal consistency reliability, the result is not a measurement problem either. The finding is consistent with Lo et al. (2017). The theoretical implication is that the DeLone & McLean (2003) model needs to be disaggregated: the information quality dimensions tied to data generation are affected by system quality, whereas those tied to communication are not.

Finally, the finding that most of technology's effect on the three characteristics operates indirectly through overall quality is of methodological value: had only the direct paths been estimated, the study would have

wrongly concluded that technology has almost no effect on relevance.

6. Conclusions and implications

The study shows that information technology adoption has a strong positive effect on the financial reporting quality of trading and service firms, explaining 28.6% of its variance. At the characteristic level, H2a, H2b and H2c are supported while H2d is rejected; the three technology components contribute almost equally. Theoretically, information quality is not a unitary construct, and the default specification of the four characteristics as a reflective second-order construct may not be supported by the data.

For business managers, the first recommendation is balanced rather than lopsided investment: because the three technology components are of nearly equal importance, firms should review and upgrade whichever component lags behind – for example, electronic authorisation workflows and the flow of source documents – rather than concentrating resources on a single item. The second recommendation is not to expect technology to solve presentation problems: if the goal is to make reports more understandable to banks or investors, budgets should go towards the reporting and communication skills of the accounting department and the quality of the notes to the financial statements.

For regulators and standard setters, policies encouraging digitalisation have a solid empirical basis but should be framed within their proper scope: digitalisation improves reliability and comparability but does not comprehensively raise reporting quality. Understandability requires dedicated policy instruments, such as minimum content requirements for the notes to the financial statements and presentation and disclosure guidance for unlisted entities. Moreover, because technology explains only about three-tenths of the variation in reporting quality, the independent audit remains indispensable.

The study is limited by its cross-sectional survey design and by perception-based assessments of reporting quality from preparers and reviewers. Future research could combine audited financial statement data or follow firms over several years to strengthen causal inference.

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