MINISTRY OF INDUSTRY AND TRADE
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THE IMPACT OF INTELLECTUAL CAPITAL ON THE LEVEL OF DIGITAL TRANSFORMATION IN ACCOUNTING IN VIETNAMESE MANUFACTURING ENTERPRISES: THE MEDIATING ROLE OF INNOVATION CAPABILITY

Major: Accounting

Code: 9340301

DOCTORAL DISSERTATION SUMMARY

Hanoi - 2026

This study was completed at:
HANOI UNIVERSITY OF INDUSTRY – MINISTRY OF INDUSTRY AND TRADE

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The dissertation will be defended before the University-level Doctoral Dissertation Evaluation Committee at Hanoi University of Industry at … hours, on … (day) … (month) … (year).

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INTRODUCTION

1. Research rationale

Vietnam's manufacturing sector remains important to economic growth, while enterprises face increasing demands for cost control, data governance, and transparent information. In 2025, GDP grew by 8.02%; in the first six months of 2026, GDP increased by 8.18%, and the index of industrial production rose by 10.8% (General Statistics Office of Vietnam, 2026). Digital transformation in manufacturing involves changes to organizational processes and the use of data rather than the acquisition of technology alone (Ghosh et al., 2022).

Accounting in manufacturing enterprises is closely linked to materials management, inventory, production costs, product costing, internal control, and managerial reporting. Digital transformation in accounting concerns the integration of digital technologies into the collection, processing, sharing, and provision of accounting information. Previous studies have emphasized technological, organizational, leadership, and environmental conditions, but have not fully explained the role of knowledge-based resources in accounting digital transformation among Vietnamese manufacturers (Nguyen et al., 2025; Abu Afifa et al., 2024).

Intellectual capital provides a useful perspective through human capital (knowledge, skills, and learning capability), structural capital (organizational processes, databases, and systems), and relational capital (knowledge accessed through customers, suppliers, and partners). Previous research has linked intellectual capital to innovation and organizational outcomes in Vietnamese manufacturing enterprises (Truong et al., 2024); however, those outcomes should not be equated with the level of digital transformation within the accounting function.

The Resource-Based View, Knowledge-Based View, and Dynamic Capabilities Theory suggest that knowledge-based resources may help develop innovation capability, which in turn can support changes to accounting systems and processes. Innovation capability enables enterprises to recognize opportunities, test solutions, and reorganize activities. Its mediating role is therefore an empirical proposition requiring examination rather than an automatic consequence of the theoretical framework (Teece, 2007; Ellström et al., 2022).

The studies reviewed typically address separate links, including intellectual capital and innovation, dynamic capabilities and digitalization, or determinants of accounting digital transformation. Findings about firm performance or the benefits of digital technologies provide indirect rather than direct evidence of the proposed relationships within the accounting function. Accordingly, this dissertation examines human capital,

structural capital, and relational capital both directly and indirectly through innovation capability, without assuming a single coefficient for aggregate intellectual capital.

The empirical context also matters. Manufacturing accounting requires connections among purchasing, warehouse records, production data, sales, and financial reporting. Small and medium-sized enterprises may face resource constraints in developing these connections. The dissertation therefore considers digital transformation in accounting as a function-specific outcome distinct from enterprise-wide digital transformation and examines the relevance of its measurement indicators to the Vietnamese manufacturing context.

The central research gap is the limited evidence on an integrated resource–capability–outcome framework that jointly examines the three intellectual capital components, innovation capability, and digital transformation in accounting within Vietnamese manufacturing enterprises. The dissertation aims to provide empirical evidence on these relationships and identify managerial and policy implications that are relevant to manufacturing accounting practices.

In methodological terms, the literature uses different indicators of digital adoption and organizational transformation. Measures developed for enterprise-wide transformation or accounting service providers may not fully capture integrated accounting activities in manufacturing firms. Therefore, measurement choices must be interpreted in relation to their conceptual and contextual boundaries.

Against this background, the dissertation entitled 'The Impact of Intellectual Capital on the Level of Digital Transformation in Accounting in Vietnamese Manufacturing Enterprises: The Mediating Role of Innovation Capability' seeks to clarify the relationships among these constructs and offer evidence-informed implications for accounting management and enterprise support.

2. Research objectives and research questions

Overall objective

The study aims to analyze the impact of intellectual capital on the level of digital transformation in accounting in Vietnamese manufacturing enterprises, while also examining the mediating role of innovation capability in this relationship. Based on the findings, the study proposes appropriate managerial implications and recommendations to promote digital transformation in accounting within Vietnamese manufacturing enterprises.

Specific objectives

Based on the overall objective, the study aims to:

Objective 1: To synthesize the theoretical foundation and review prior studies in order to define the conceptual scope of intellectual capital, innovation capability, and

the level of digital transformation in accounting in the context of Vietnamese manufacturing enterprises.

Objective 2: To examine the effects of each component of intellectual capital, including human capital, structural capital, and relational capital, on enterprises' innovation capability.

Objective 3: To examine the direct effects of each component of intellectual capital and the effect of innovation capability on the level of digital transformation in accounting in Vietnamese manufacturing enterprises.

Objective 4: To examine the mediating role of innovation capability in the relationship between the components of intellectual capital and the level of digital transformation in accounting.

Objective 5: To propose managerial and policy implications for advancing digital transformation in accounting in Vietnamese manufacturing enterprises, based on the research findings.

To achieve these objectives, the study addresses the following research questions:

Research Question 1: How does intellectual capital, examined through human capital, structural capital, and relational capital, relate to innovation capability in Vietnamese manufacturing enterprises?

Research Question 2: How are the components of intellectual capital and innovation capability associated with the level of digital transformation in accounting in Vietnamese manufacturing enterprises?

Research Question 3: How does innovation capability mediate the relationships between the intellectual capital components and the level of digital transformation in accounting?

Research Question 4: What managerial and policy implications can be proposed to support digital transformation in accounting in Vietnamese manufacturing enterprises?

3. Research subject and scope

Research subject

The subject of the dissertation is the relationship between intellectual capital components and the level of digital transformation in accounting, with innovation capability examined as a mediating variable, in Vietnamese manufacturing enterprises.

Research scope

Geographical scope: Vietnamese manufacturing enterprises.

Time scope: The survey data were collected and processed in 2025. The synthesis of theoretical foundations, development of the research model, and empirical testing were conducted throughout 2024–2026.

4. Research methodology

To achieve the research objectives, this study adopts a mixed-methods approach, combining qualitative and quantitative research.

Qualitative research: A review of prior studies was undertaken to synthesize the theoretical foundations, identify research gaps, develop hypotheses, and adapt preliminary measurement indicators. Expert consultation and pilot assessment supported the refinement of the research model and questionnaire for the Vietnamese manufacturing context.

Quantitative research: The study uses 417 valid questionnaires collected from respondents working in 257 Vietnamese manufacturing enterprises in 2025. The questionnaire contains 53 observed indicators. SPSS and SmartPLS are used for reliability assessment, exploratory factor analysis (EFA), measurement-model evaluation, PLS-SEM, and bootstrapping. The use of non-probability sampling and multiple respondents from some enterprises is taken into account when interpreting the findings.

5. Novel contributions of the study

Theoretical contributions

First, the dissertation develops and tests an integrated framework connecting intellectual capital components, innovation capability, and digital transformation in accounting. Intellectual capital is treated as a unified but multidimensional concept; human capital, structural capital, and relational capital are estimated separately, without specifying a single higher-order intellectual capital effect.

Second, the dissertation examines innovation capability as a potential mediating mechanism linking each component of intellectual capital to the level of digital transformation in accounting. The findings indicate statistically significant indirect relationships alongside significant direct relationships, consistent with complementary mediation in the estimated model.

Third, the study conceptualizes digital transformation in accounting as a functional-level outcome involving accounting data, processes, controls, and decision support in manufacturing enterprises. Its measurement assessment provides context-specific evidence but does not establish a universally standardized instrument for all enterprises.

Practical contributions

The empirical findings suggest that digital transformation in accounting may be supported by the development of employee competencies, the improvement of organizational systems and knowledge-sharing processes, external relationships, and innovation capability. These implications should be interpreted as evidence-based directions rather than proof of causal effects.

For enterprise managers, the results provide a basis for prioritizing accounting process improvements, data integration, staff development, and collaboration with

technology partners. For policy authorities, relevant implications concern electronic invoices, digital accounting and tax compliance, compatible data standards, and secure exchange of information within the legal framework for digital government.

6. Structure of the study

In addition to the Introduction and Conclusion, the study consists of five chapters:

Chapter 1: Literature Review

Chapter 2: Theoretical Background and Foundations

Chapter 3: Research Methodology and Research Model

Chapter 4: Research Results

Chapter 5: Discussion of Findings, Policy and Managerial Implications, and Conclusion

CHAPTER 1: LITERATURE REVIEW

1.1. Overview of Studies on Intellectual Capital

Intellectual capital has been widely studied in the fields of management, accounting, corporate finance, and knowledge management. In the modern economy, competitive advantage increasingly depends on intangible knowledge-based resources rather than solely on tangible assets. Edvinsson and Malone (1997) and Sveiby (1997) argue that intellectual capital reflects the value of intangible assets that play an important role in long-term performance, adaptability, and innovation. Given the differences in conceptual approaches, this study focuses on reviewing the approaches, measurement methods, and impacts of intellectual capital.

1.1.1. Research Approaches to Intellectual Capital

Studies on intellectual capital are commonly approached from three main perspectives. First, intellectual capital is viewed as a strategic intangible resource of the enterprise, including knowledge, experience, systems, processes, organizational technologies, and relationships that are capable of creating long-term value. This approach is closely associated with the resource-based view and the knowledge-based view, emphasizing the role of difficult-to-imitate resources in creating sustainable competitive advantage.

Second, intellectual capital is considered a multidimensional construct comprising human capital, structural capital, and relational capital. This is a common approach in empirical research because it enables an abstract concept to be operationalized into specific measurable components.

Third, some recent studies argue that the structure of intellectual capital should be adjusted according to industry context and research objectives. For Vietnamese manufacturing enterprises, structural capital, data, operational processes, and internal linkages are particularly important. Therefore, this study adopts the three-component structure of intellectual capital to develop the research model.

1.1.2. Measurement of Intellectual Capital in Empirical Research

Studies on intellectual capital generally employ three main measurement approaches. First, intellectual capital is measured using financial data, accounting indicators, or market-based measures such as VAIC. This approach is convenient for secondary data analysis but only indirectly reflects knowledge-based assets.

Second, intellectual capital is measured using survey-based scales focusing on human capital, structural capital, and relational capital. This approach is suitable for studies in management, innovation, and digital transformation in accounting.

Third, measurement scales are adjusted according to specific industry contexts. Accordingly, this study adopts a survey-based measurement approach, with appropriate modifications to fit the context of Vietnamese manufacturing enterprises.

1.1.3. Studies on the Impact of Intellectual Capital on Organizational Outcomes

Empirical studies often regard intellectual capital as an important explanatory variable for financial performance, operational performance, competitive advantage, innovation, technological capability, and digital transformation in accounting. Most evidence indicates that intellectual capital has a positive relationship with organizational outcomes, although the magnitude of its impact may vary across industries and among its components. Many studies also emphasize the mediating roles of innovation capability, technological capability, and organizational capabilities. However, research on intellectual capital and digital transformation in accounting within Vietnamese manufacturing enterprises remains limited.

1.1.4. General Evaluation of Studies Related to Intellectual Capital

The literature reviewed provides a well-established conceptual foundation for intellectual capital, generally described through human, structural, and relational capital. Nevertheless, evidence concerning the specific outcome of digital transformation in accounting in Vietnamese manufacturing enterprises remains limited. This study therefore evaluates individual component-level relationships and innovation capability as a proposed mediator.

1.2. Overview of Studies on Innovation Capability

In modern enterprise research, innovation capability is considered a core organizational capability that enables enterprises to adapt, maintain competitive advantage, and exploit development opportunities. Unlike earlier studies that primarily focused on innovation outcomes, such as new products, new processes, or innovation performance, later studies emphasize the internal capability that enables enterprises to continuously create and implement innovation.

1.2.1. Research Approaches to Innovation Capability

Studies approach innovation capability from three main perspectives. First, innovation capability is viewed as a dynamic capability that enables enterprises to sense

opportunities, mobilize resources, reconfigure processes, and create value (Teece, 2007; Tran, 2019). Second, innovation capability reflects the ability to transform knowledge and ideas into new products, processes, systems, or organizational methods (Lawson & Samson, 2001; Saunila, 2016). Third, innovation capability is considered a mediating variable between strategic resources and organizational outcomes (Aljuboori et al., 2022; Lang et al., 2023).

Studies approach innovation capability as a dynamic organizational capability, as the ability to translate knowledge into new practices, and as a potential mediator between strategic resources and organizational outcomes (Teece, 2007; Lawson & Samson, 2001; Saunila, 2016; Aljuboori et al., 2022).

Innovation capability is a latent construct often assessed using indicators of idea generation, implementation, and organizational support for innovation. It is important to distinguish the capability to innovate from realized innovation outcomes when interpreting the mediator in the proposed model.

1.2.3. Studies on the Relationship Between Intellectual Capital and Innovation Capability

In general, studies show that intellectual capital has a positive relationship with enterprises' innovation capability, both at the aggregate level and at the level of individual components (Subramaniam & Youndt, 2005; Kianto et al., 2017; Barkat et al., 2018; Zhang et al., 2018). However, the effects of human capital, structural capital, and relational capital may differ depending on the research context. In Vietnam, empirical evidence remains limited. Some recent studies also consider innovation capability as a mediating mechanism between intellectual capital and organizational outcomes.

1.2.4. General Evaluation of Studies Related to Innovation Capability

The literature review shows that innovation capability is increasingly recognized as a core dynamic capability of enterprises, providing a theoretical basis for this study to select it as a mediating variable. However, existing studies have not reached full agreement on its measurement, as some scales reflect innovation capability, while others include innovation outcomes. Although substantial evidence indicates that intellectual capital positively affects innovation capability, this mechanism remains underexplored in the context of digital transformation in accounting, particularly in Vietnamese manufacturing enterprises.

1.3. Overview of Studies on the Level of Digital Transformation in Accounting

1.3.1. Research Approaches to Digital Transformation in Accounting

Digital transformation in accounting is approached from three main perspectives.

First, it is viewed as a process of digitalizing and automating accounting operations through accounting software, ERP, Big Data, artificial intelligence, blockchain, and cloud computing (Granlund & Malmi, 2002; Juniardi & Putra, 2024). Second, digital transformation facilitates data integration and expands the role of accounting from transaction recording to analysis, forecasting, and decision support (Appelbaum et al., 2017; Begkos et al., 2024).

Third, it changes modern accounting operating models and practices within enterprises.

1.3.2. Measurement of the Level of Digital Transformation in Accounting

Existing studies have not yet developed a fully unified scale for measuring the level of digital transformation in accounting. However, three main measurement approaches can be identified. First, it is measured based on the extent to which digital technologies such as ERP, AI, blockchain, cloud computing, and data analytics are adopted (Juniardi & Putra, 2024; Hasan, 2025). Second, it is measured through the degree of automation and integration of accounting processes with enterprise systems, data, and business intelligence (Appelbaum et al., 2017). Third, it is measured according to the level of digital maturity in accounting practices. Therefore, this study needs to refine the measurement scale to fit the context of Vietnamese manufacturing enterprises.

1.3.3. Studies on Factors Affecting Digital Transformation in Accounting

Studies show that digital transformation in accounting is influenced by organizational, managerial, cultural, skill-related, and resource-based factors. Organizational readiness, strategic alignment, and top management support are found to promote this process (Nguyen et al., 2025). However, skill gaps, investment costs, and cultural resistance remain important barriers (Hasan, 2025).

1.3.4. General Evaluation of Studies Related to the Level of Digital Transformation in Accounting

The literature review indicates that digital transformation in accounting has attracted increasing scholarly attention, but research remains fragmented in terms of approaches and measurement. Digital transformation is not merely the use of technology; rather, it reflects the extent to which technology is integrated into accounting data, processes, control systems, reporting, and decision support. In Vietnam, empirical evidence remains limited, although the study by Nguyen et al. (2025) provides an initial foundation. Therefore, this study considers digital transformation in accounting as a multidimensional construct and refines the measurement scale according to the specific characteristics of Vietnamese manufacturing enterprises.

1.4. Overview of Studies on the Relationship Among Intellectual Capital, Innovation Capability, and the Level of Digital Transformation in Accounting

1.4.1. Studies on the Effect of Intellectual Capital on Innovation Capability

Prior research suggests that intellectual capital is associated with innovation capability, although the relationships may differ among human, structural, and relational capital and across research contexts (Beltramino et al., 2020; Subramaniam & Youndt, 2005). The present study estimates the three components separately rather than assuming equal effects.

1.4.2. Studies on the Effect of Intellectual Capital on the Level of Digital Transformation in Accounting

Previous research offers explanations for the relationships between knowledge-based resources, technological capabilities, and digital innovation. However, these outcomes do not directly establish the level of digital transformation within the accounting function. Evidence from accounting-related contexts also needs to be interpreted in light of the outcome measured and the type of organization studied (Hsiung & Lin, 2025).

1.4.3. Studies on the Mediating Role of Innovation Capability in the Relationship Between Intellectual Capital and the Level of Digital Transformation in Accounting

The literature has explored innovation capability as a mediator linking intellectual capital to organizational outcomes (Aljuboori et al., 2022; Alshahrani et al., 2024). However, evidence on its mediating role for digital transformation specifically within the accounting function of Vietnamese manufacturing enterprises is more limited. This dissertation tests the direct and indirect relationships separately.

1.4.4. Studies Related to the Relationship Among Intellectual Capital, Digital Transformation in Accounting, and Accounting Information Quality

Related studies have investigated accounting digital transformation and its organizational antecedents without jointly examining the three intellectual capital components and innovation capability in the present research context. For instance, Nguyen et al. (2025) address accounting digital transformation among Vietnamese SMEs, while Appelbaum et al. (2017) consider the changing role of data and integrated systems in management accounting. These findings are relevant but do not directly test the proposed mediation model.

1.4.5. General Evaluation and Implications for the Study

The evidence reviewed provides support for studying the proposed relationships but does not establish them simultaneously for the accounting function in Vietnamese manufacturing enterprises. The dissertation accordingly tests separate links among the intellectual capital components, innovation capability, and digital transformation in accounting, while distinguishing function-specific outcomes from enterprise-wide digitalization.

1.5. Research Gaps and the Study's Approach

1.5.1. Summary of Prior Studies and Issues to Be Inherited

1.5.2. Research Gaps

The research gaps of the study are reflected in four aspects.

Theoretical gap: The reviewed literature addresses different combinations of intellectual capital, innovation capability, and digital transformation, leaving scope to test an integrated resource–capability–outcome framework for the accounting function.

Methodological gap: Prior studies use heterogeneous indicators of technology adoption and digital transformation. Measures for enterprise-wide transformation or accounting service firms may not fully reflect the processes and data connections relevant to manufacturing accounting.

Contextual gap: Evidence from service-sector firms or SMEs considered broadly cannot automatically be generalized to the accounting activities of Vietnamese manufacturing enterprises.

Mechanism gap: The indirect relationships between each intellectual capital component and digital transformation in accounting through innovation capability require direct empirical evaluation rather than inference from separate prior studies.

1.5.3. The Study's Research Approach

CHAPTER 2: THEORETICAL BACKGROUND AND FOUNDATIONS

2.1. Key concepts in the study

2.1.1. The Concept of Intellectual Capital

Intellectual capital is treated as a unified theoretical concept with a multidimensional structure, commonly comprising human capital, structural capital, and relational capital (Sveiby, 1997; Bontis, 1998). The dissertation estimates these components as distinct

explanatory variables; it does not estimate a second-order aggregate intellectual capital variable and therefore does not report an overall intellectual capital path coefficient.

2.1.2. The Concept of Enterprise Innovation Capability

Innovation capability is understood as an enterprise's ability to generate, develop, and realize new ideas into products, services, processes, or systems in order to create value and improve operational performance (Lawson & Samson, 2001; Hogan et al., 2011; Saunila, 2016).

2.1.3. The Concept of Digital Transformation in Manufacturing Enterprises

2.1.3.1. The Concept of Digital Transformation

Digital transformation refers to the process of creating significant changes in organizational activities, processes, capabilities, and models through the integration of information technology, computing, communication, and connectivity (Vial, 2019).

2.1.3.2. The Concept of Enterprise Digital Transformation

Enterprise digital transformation is the process of integrating digital technologies into functional areas such as finance, production, marketing, human resource management, and corporate governance in order to improve operational efficiency, customer experience, and business models (Mazzone, 2014; Fitzgerald et al., 2014).

2.1.3.3. The Concept of Digital Transformation in Accounting

In this dissertation, digital transformation in accounting refers to the integration and use of digital technologies to change how accounting information is collected, processed, controlled, analyzed, and communicated. It encompasses business-process automation, data integration, and changes in accounting practices, rather than the presence of accounting software alone (Vial, 2019; Verhoef et al., 2021; Nguyen et al., 2025).

2.1.3.4. The Concept of Manufacturing Enterprises

Manufacturing enterprises transform materials, labor, equipment, and technological inputs into products. Their accounting activities are closely associated with material flows, work in progress, manufacturing costs, inventory, product costing, internal controls, and information for managerial decisions.

2.1.3.5. The Concept of Digital Transformation in Accounting in Manufacturing Enterprises

Digital transformation in accounting within manufacturing enterprises involves integrating digital technologies into accounting processes and connecting source documents, materials records, inventory movements, production costs, product costing, sales, and financial information. It is a function-specific concept and should not be equated with enterprise-wide digital transformation or with the subsequent quality of accounting information.

2.2. Underlying Theories of the Study

2.2.1. Theories Related to Intellectual Capital

2.2.1.1. Resource-Based View

The resource-based view considers an enterprise as a collection of heterogeneous and relatively immobile resources and capabilities that create sustainable competitive advantage. Wernerfelt (1984), Barney (1991), and Peteraf (1993) emphasize the role of resources that are valuable, rare, difficult to imitate, and difficult to substitute. On this basis, intellectual capital is regarded as a strategic intangible resource consisting of human capital, structural capital, and relational capital. In manufacturing enterprises, intellectual capital provides the foundation for innovation capability and promotes digital transformation.

2.2.1.2. Knowledge-Based View

The knowledge-based view regards knowledge as the most important resource and views the enterprise as a mechanism for integrating, combining, and creating knowledge (Grant, 1996; Kogut & Zander, 1992). Nonaka and Takeuchi (1995) emphasize the conversion between tacit and explicit knowledge through the SECI model. When combined with the resource-based view, intellectual capital can be understood as the manifestation of knowledge at the individual, organizational, and network levels, including human capital, structural capital, and relational capital. These elements provide a foundation for enterprise innovation and digital transformation in accounting.

2.2.2. Dynamic Capability Theory and the Central Role of Innovation Capability

Dynamic Capabilities Theory explains why organizational outcomes may depend not only on access to resources but also on the ability to renew, combine, and reconfigure those resources (Teece et al., 1997; Teece, 2007). In this framework, innovation capability is proposed as a mediator that may help translate intellectual capital components into accounting process changes; the existence and magnitude of mediation remain empirical questions.

2.2.3. Technology–Organization–Environment Framework

The Technology–Organization–Environment (TOE) framework describes the technological, organizational, and environmental conditions surrounding the adoption of innovations (Tornatzky & Fleischer, 1990; Oliveira & Martins, 2011). In this dissertation, TOE informs the interpretation of the implementation context. It does not imply that every technological, organizational, and environmental dimension is directly estimated in the structural model.

2.3. Integrated Theoretical Framework on the Relationship Among Intellectual Capital, Innovation Capability, and the Level of Digital Transformation in Accounting

2.3.1. The Relationship Among Resources, Capabilities, and Outcomes in the Context of Manufacturing Enterprises

Fundamental theories such as the resource-based view, the knowledge-based view, and dynamic capability theory all emphasize the resource–capability–outcome relationship. In this relationship, intellectual capital is considered a strategic intangible resource comprising human capital, structural capital, and relational capital, while innovation capability is a dynamic capability that enables enterprises to exploit, reconfigure, and transform resources into outcomes (Barney, 1991; Grant, 1996; Teece, 2007). In the context of Vietnamese manufacturing enterprises, this study considers innovation capability as a mediating variable between intellectual capital and the level of digital transformation in accounting.

2.3.2. The Relationship From Intellectual Capital to Innovation Capability and the Level of Digital Transformation in Accounting

2.3.2.1. The Relationship Between Intellectual Capital, Innovation Capability, and the Level of Digital Transformation in Accounting

Human capital, structural capital, and relational capital are three important components of intellectual capital that jointly provide the foundation for innovation capability. Human capital provides knowledge, skills, experience, and digital competencies for generating and implementing innovative ideas (Subramaniam & Youndt, 2005; Rideg et al., 2023). Structural capital includes processes, systems, data, and knowledge management mechanisms that support coordination, knowledge sharing, and innovation implementation (Belmonte da Silva, 2021). Relational capital enables enterprises to access external knowledge, technological trends, and experience in implementing digital transformation.

2.3.2.2. The Relationship Between Innovation Capability and the Level of Digital Transformation in Accounting

Innovation capability enables enterprises to identify digitalization opportunities and design, test, implement, and institutionalize digital transformation solutions. According to Lawson and Samson (2001) and Saunila (2020), innovation capability is a dynamic capability that includes idea generation, selection, solution design, and experimental implementation. In the context of digital transformation, this capability allows enterprises not merely to purchase separate technologies but also to restructure processes, data, systems, and digital culture. Recent studies show that enterprises with strong innovation capability tend to achieve a higher level of digital maturity.

2.3.2.3. General Evaluation

The proposed framework distinguishes a direct association between intellectual capital components and digital transformation in accounting from an indirect association transmitted through innovation capability. Knowledge, organizational routines, and external relationships may facilitate accounting transformation, while innovation capability may support the testing and implementation of new accounting processes.

Both pathways are tested empirically rather than treated as established causal mechanisms.

2.3.3. The Contextual Role of TOE in the Relationship Among Intellectual Capital, Innovation Capability, and the Level of Digital Transformation in Accounting

The TOE framework offers contextual guidance on how technological readiness, organizational arrangements, and the external environment may facilitate or constrain digital adoption. These contextual considerations are discussed without suggesting that the structural model estimates all TOE dimensions. Enterprise size, age, and manufacturing sector are included as controls in the estimated accounting digital transformation equation.

2.3.4. Theoretical Implications for the Development of the Research Model

CHAPTER 3: RESEARCH METHODOLOGY AND RESEARCH MODEL

3.1. Research process

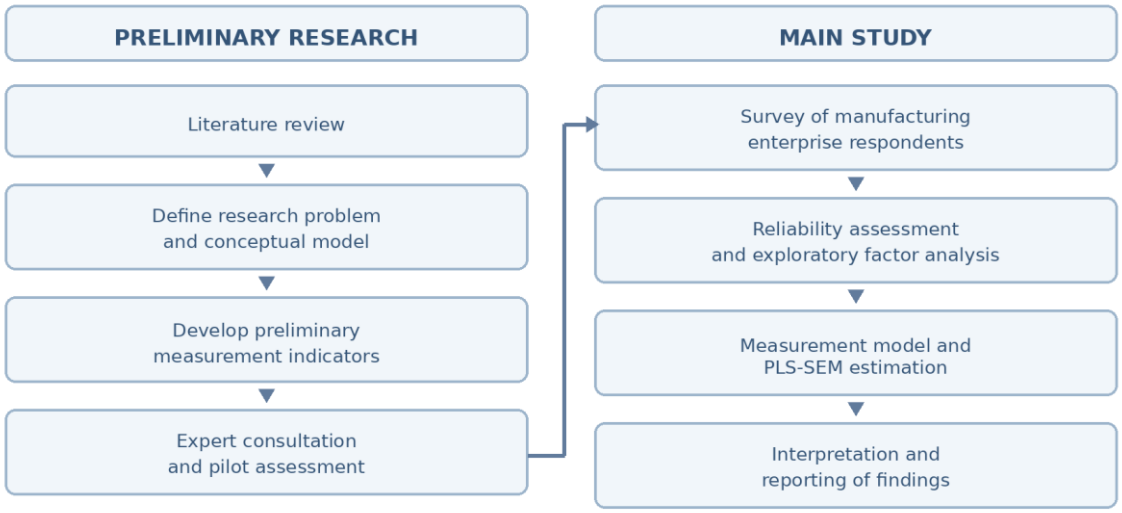


Figure 3.1: Research Process

3.2. Formal research model and research hypotheses

3.2.1. Formal Research Model

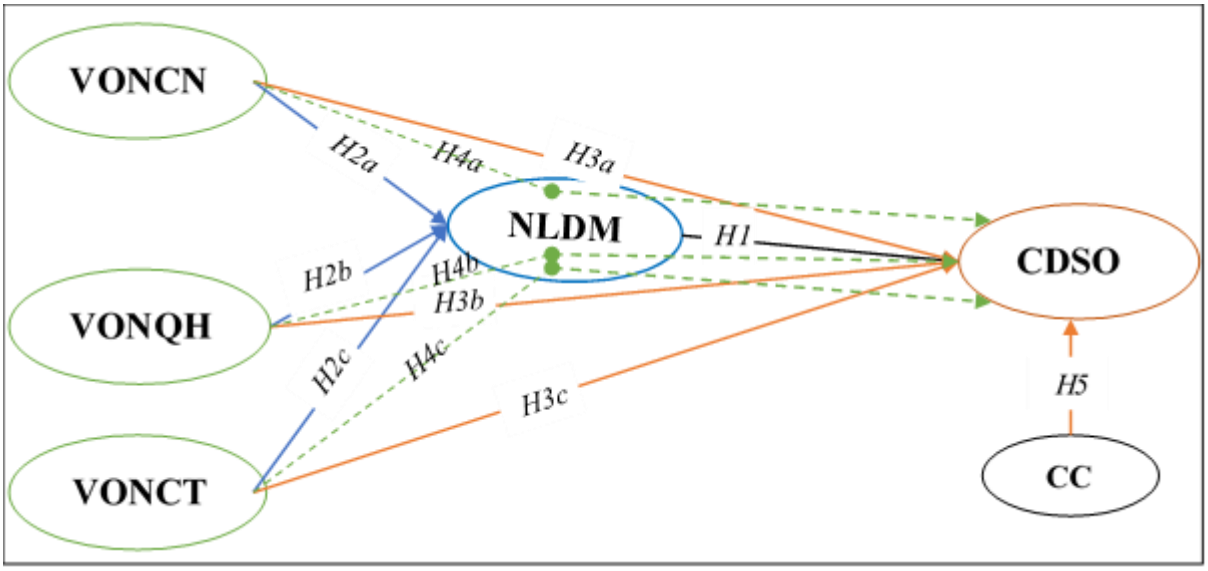


Figure 3.2: Research Model

(Source: The author)

The proposed framework is represented by two structural equations. Direct, indirect, and total effects are reported separately:

Structural equation (1): Intellectual capital components and innovation capability

$NLDM = \beta_1 VONCN + \beta_2 VONCT + \beta_3 VONQH + \varepsilon_1$

Structural equation (2): Digital transformation in accounting

$CDSO = \beta_4 NLDM + \beta_5 VONCN + \beta_6 VONCT + \beta_7 VONQH + \gamma_1 FirmSize + \gamma_2 FirmAge + \gamma_3 ManufacturingSector + \varepsilon_2$

Indirect and total effects:

For each intellectual capital component, the indirect effect is the product of the two paths through NLDM. The total effect is the sum of the corresponding direct and indirect effects; it is not included again as a separate coefficient in equation (2).

Variable definitions:

CDSO is the level of digital transformation in accounting (dependent variable).

The independent variables include:

VONCN denotes human capital, representing employees' knowledge, skills, creativity, and attitudes.

VONCT denotes structural capital, representing the systems and structures of an enterprise, including corporate culture, organizational structure, organizational learning, operational processes, and information systems.

VONQH denotes relational capital, representing the value created through marketing channels and the relationships that an enterprise develops in its business activities.

NLDM denotes innovation capability, reflecting the enterprise's ability to develop, evaluate, and implement innovative ideas and practices.

The control variables include:

Firm Size, representing the size of the enterprise.

Firm Age, representing the age of the enterprise.

Manufacturing Sector, representing the specific field of manufacturing activity.

The empirical model distinguishes human, structural, and relational capital as separate explanatory variables, innovation capability as the mediator, and digital transformation in accounting as the dependent variable. The hypothesis system comprises five groups and eleven specific hypotheses (H1, H2a–H2c, H3a–H3c, H4a–H4c, and H5).

3.2.2. Identification of Variables in the Model and Hypothesis Development

3.2.2.1. The Level of Digital Transformation in Accounting

3.2.2.2. Enterprise Innovation Capability

Based on prior studies, the author develops the following research hypothesis:

Hypothesis H1: Innovation capability has a positive relationship with the level of digital transformation in accounting in enterprises.

3.2.2.3. Human Capital

The author develops the following research hypotheses:

Hypothesis H2a: Human capital has a positive relationship with innovation capability.

Hypothesis H3a: Human capital has a positive relationship with the level of digital transformation in accounting.

Hypothesis H4a: Human capital has a positive relationship with the level of digital transformation in accounting through the mediating role of innovation capability.

3.2.2.4. Structural Capital

Based on the above discussion, the author develops the following research hypotheses:

Hypothesis H2b: Structural capital has a positive relationship with innovation capability.

Hypothesis H3b: Structural capital has a positive relationship with the level of digital transformation in accounting.

Hypothesis H4b: Structural capital has a positive relationship with the level of digital transformation in accounting through the mediating role of innovation capability.

3.2.2.5. Relational Capital

Based on the above discussion, the author develops the following research hypotheses:

Hypothesis H2c: Relational capital has a positive relationship with innovation capability.

Hypothesis H3c: Relational capital has a positive relationship with the level of digital transformation in accounting.

Hypothesis H4c: Relational capital has a positive relationship with the level of digital transformation in accounting through the mediating role of innovation capability.

3.3. Research Sample

3.3.1. Sample Size

3.3.2. Sampling Method and Implementation Procedure

3.3.2.1. Sampling Method

3.3.2.2. Implementation Procedure

The final survey comprises 417 valid questionnaires from 257 manufacturing enterprises. Respondents include employees, managers, and business leaders familiar with accounting, management, or digital transformation. Of all survey responses, 78.2% are associated with enterprises employing no more than 100 workers. Because non-probability sampling was used and some enterprises contributed multiple responses, 417 questionnaires should not be interpreted as 417 independent enterprises.

3.4. Questionnaire Development

3.4.1. Procedure for Developing the Questionnaire

3.4.2. Content of the Questionnaire

3.4.3. Measures to Ensure the Reliability of the Questionnaire

The questionnaire uses a five-point Likert scale and 53 observed indicators. The indicators were adapted and reviewed for the Vietnamese manufacturing context; nevertheless, some digital accounting indicators focus on specific technologies and should not be treated as a complete measurement of accounting-process transformation.

3.5. Data Processing and Analysis Methods

3.5.1. Assessment of the Reliability of the Method and the Collected Data

3.5.2. Descriptive Statistical Analysis

3.5.3. Assessment of the Reliability and Validity of the Measurement Scales

3.5.3.1. Assessment of Scale Reliability Using Cronbach's Alpha

3.5.3.2. Assessment of Scale Validity Using Exploratory Factor Analysis

3.5.3.3. Assessment of Scale Reliability and Validity Using the Measurement Model

3.5.4. Regression Analysis Using Structural Equation Modeling

3.5.5. Testing the robustness of estimated coefficients using Bootstrap

CHAPTER 4: RESEARCH RESULTS

4.1. Characteristics of the Research Sample

4.1.1. Characteristics of Survey Respondents

4.1.2. Intellectual Capital, Innovation Capability, and Digital Transformation in Manufacturing Enterprises

4.1.2.1. Intellectual capital of enterprises

4.1.2.2. Innovation capability of enterprises

4.1.2.3. Enterprise-Wide Digital Transformation Context Based on Secondary Data

4.1.3. The Level of Digital Transformation in Accounting in Enterprises

The sample comprises 118 employees (28.3%), 175 managers (42.0%), and 124 executives (29.7%). Regarding enterprise size, 25.9% of responses are from enterprises with fewer than 50 employees, 52.3% from those with 50–100 employees, and 21.8% from those with more than 100 employees. The mean scores of five accounting digital transformation indicators range from 3.58 to 3.86 on a five-point scale. These descriptive proportions characterize the sample rather than all Vietnamese manufacturing enterprises.

4.2. Assessment of the Reliability of the Collected Data

Table 4.4 CMB test results for survey data (N=417)

KMO value		0.939
Bartlett's test	Approx. Chi - Square	18265.67
	df	1378
	Sig.	0.000
Number of observed variables		53
Number of contributing factors		1
Total variance extracted for a single factor		35.997%

(Source: Compiled by the author from data analysis results using SmartPLS)

Harman's single-factor screening indicates that one factor explains 35.997% of total variance across 53 observed indicators, below the commonly used 50% screening threshold. This result does not eliminate all possibility of common method bias. KMO is 0.939, and Bartlett's test is statistically significant, supporting the suitability of the data for factor analysis.

4.3. Reliability and Validity Assessment of the Measurement Scales

4.3.1. Preliminary Assessment of Scale Reliability and Validity

4.3.1.1. Reliability of the scale

4.3.1.2. Validity of the scales

Table 4.6 EFA analysis results (N=417)

No.	**Test**		**Value**
1	***KMO's test***		0.939
2	***Bartlett's test***	Approx. Chi - Square	18265.67

		df	1378
		Sig.	<0.001
3	***Total Variance Explained***	Number of Components	11
		Initial Eigenvalue	1.067
		% of Variance	75.457
4	***Factor Loading***		> 0.5

(Source: Compiled by the author from data analysis results using SmartPLS)

Exploratory factor analysis of 417 responses yields 11 factors with eigenvalues greater than one and a cumulative explained variance of 75.457%. The reported indicator loadings exceed 0.50. These results provide preliminary support for assessing the measurement structure before PLS-SEM estimation.

4.3.2. Measurement Model Assessment of Scale Reliability and Validity

4.3.2.1. Scale Reliability and Convergent Validity

Table 4.8. Reliability and Convergent Validity Assessment

Scales	**Cronbach's Alpha**	**Composite Reliability**	**Average Variance Extracted (AVE)**
Scales for measuring Innovation Capability			
VHDM	0.836	0.902	0.754
CCDM	0.877	0.916	0.731
TTDM	0.872	0.907	0.662
Scales for measuring Relational Capital			
DVKH	0.933	0.952	0.832
PPSP	0.873	0.922	0.797
QHDT	0.85	0.899	0.689

Scales	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Scales for measuring Structural Capital			
TCHD	0.919	0.943	0.804
VHDN	0.849	0.899	0.692
CNTT	0.904	0.933	0.776
The Human Capital Scale is composed of 13 observed variables			
VONCN	0.972	0.974	0.746
The digital transformation in accounting scale is composed of 5 observed variables			
CDSO	0.875	0.909	0.668
Validation of second-order scales			
NLDM	0.719	0.842	0.64
VONCT	0.742	0.854	0.662
VONQH	0.711	0.837	0.631

(Source: Compiled by the author from data analysis results using SmartPLS)

The reported composite reliability values exceed 0.80, and the average variance extracted (AVE) values exceed 0.50. For digital transformation in accounting (CDSO), Cronbach's alpha is 0.875, composite reliability is 0.909, and AVE is 0.668. These findings support the scale reliability and convergent validity criteria used in the dissertation.

4.3.2.2. Discriminant Validity

Table 4.9. Fornell–Larcker Criterion

Variables	CCDM	CDSO	CNTT	DVKH	PPSP	QHDT	TCDH	TTDM	VHDM	VHDN	VONCN
CCDM	**0.855**										
CDSO	0.467	**0.817**									
CNTT	0.319	0.361	**0.881**								
DVKH	0.277	0.347	0.225	**0.912**							
PPSP	0.454	0.449	0.192	0.416	**0.893**						
QHDT	0.322	0.422	0.306	0.468	0.446	**0.83**					
TCDH	0.329	0.456	0.439	0.266	0.392	0.463	**0.897**				
TTDM	0.526	0.512	0.276	0.359	0.53	0.405	0.387	**0.814**			
VHDM	0.468	0.449	0.257	0.232	0.315	0.289	0.249	0.379	**0.868**		
VHDN	0.350	0.42	0.404	0.222	0.422	0.341	0.622	0.447	0.239	**0.832**	
VONCN	0.332	0.512	0.354	0.3	0.371	0.52	0.669	0.47	0.337	0.437	**0.864**

The variables are on a second-order scale

	NLDM	VON CT	VONQH
NLDM	**0.80**		
VONCT	0.495	**0.814**	
VONQH	0.576	0.498	0.794

(Source: Compiled by the author from data analysis results using SmartPLS)

Table 4.10. Heterotrait–Monotrait Ratio (HTMT)

	CCDM	CD SO	CN TT	DV KH	PP SP	QH DT	TC DH	TT DM	VH DM	VH DN
CCDM										

	CCDM	CD SO CN TT		DV KH	PP SP	QH DT	TC DH	TT DM	VH DM	VH DN
CDSO	0.535									
CNTT	0.358	0.406								
DV KH	0.306	0.382	0.245							
PP SP	0.517	0.512	0.215	0.46						
QH DT	0.374	0.487	0.349	0.525	0.516					
TCDH	0.365	0.509	0.482	0.287	0.436	0.524				
TTDM	0.599	0.586	0.311	0.399	0.607	0.471	0.431			
VH DM	0.545	0.526	0.296	0.264	0.37	0.344	0.283	0.444		
VH DN	0.407	0.488	0.46	0.252	0.491	0.403	0.703	0.524	0.286	
VONCN	0.358	0.554	0.376	0.315	0.402	0.573	0.707	0.508	0.371	0.481

The variables are on a second-order scale

	NLDM	VONCT	VONQH
NLDM			
VONCT	0.667		
VONQH	0.777	0.67	

(Source: Compiled by the author from data analysis results using SmartPLS)

The Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT) are used to assess discriminant validity. Their interpretation should also consider indicator content, particularly the technology-specific indicators used for digital transformation in accounting.

4.4. Estimated Relationships among Intellectual Capital Components, Innovation Capability, and Digital Transformation in Accounting

4.4.1. Model description

Table 4.11. Collinearity Assessment (VIF)

Model	(2) CDSO	(1) NLDM
Independent variable	*VIF*	*VIF*
Manufacturing sector	1.022	
NLDM	1.689	
Firm size	1.058	
Firm age	1.015	
VONCN	1.772	1.722
VONCT	1.841	1.716
VONQH	1.729	1.451

(Source: Compiled by the author from data analysis results using SmartPLS)

The reported variance inflation factors (VIFs) range from 1.015 to 1.841, indicating no serious multicollinearity under the assessment criteria adopted. Enterprise size, enterprise age, and manufacturing sector remain control variables in the accounting digital transformation equation.

4.4.2. Results of Structural Model Estimation

Table 4.12. PLS-SEM Structural Model Results

Estimated relationship	Coefficient (β)	SD	t-value	p-value
Intellectual capital components → Innovation capability (NLDM)				
VONCN → NLDM	0.16	0.06	2.64	0.009
VONCT → NLDM	0.20	0.06	3.48	0.001
VONQH → NLDM	0.40	0.05	7.96	<0.001
Direct associations with accounting digital transformation (CDSO)				
NLDM → CDSO	0.35	0.04	8.26	<0.001
VONCN → CDSO	0.16	0.05	3.53	<0.001
VONCT → CDSO	0.13	0.04	3.00	0.003
VONQH → CDSO	0.14	0.05	2.84	0.005
Firm size → CDSO	0.22	0.03	6.40	<0.001
Firm age → CDSO	0.06	0.04	1.74	0.083
Manufacturing sector → CDSO	0.05	0.04	1.40	0.162

Estimated relationship	Coefficient (β)	SD	t-value	p-value
Indirect associations via innovation capability				
VONCN → NLDM → CDSO	0.06	0.02	2.46	0.014
VONCT → NLDM → CDSO	0.07	0.02	3.25	0.001
VONQH → NLDM → CDSO	0.14	0.02	5.90	<0.001
Total associations with accounting digital transformation				
VONCN → CDSO (total)	0.22	0.049	4.423	<0.001
VONCT → CDSO (total)	0.20	0.047	4.183	<0.001
VONQH → CDSO (total)	0.28	0.045	6.14	<0.001

(Source: Compiled by the author from data analysis results using SmartPLS)

The results show positive, statistically significant associations of human capital (β = 0.16; p = 0.009), structural capital (β = 0.20; p = 0.001), and relational capital (β = 0.40; p < 0.001) with innovation capability. Innovation capability is positively related to accounting digital transformation (β = 0.35; p < 0.001). The direct coefficients of human capital, structural capital, and relational capital for CDSO are 0.16, 0.13, and 0.14. Their respective indirect coefficients through innovation capability are 0.06, 0.07, and 0.14, while the total coefficients are 0.22, 0.20, and 0.28. Among the controls, firm size is statistically significant (β = 0.22; p < 0.001), whereas firm age and manufacturing sector are not significant at the 5% level.

4.4.3. Bootstrap Assessment of Estimated Coefficients

Table 4.13. Reported Bootstrap Results (500 Resamples)

Predictor	Outcome	Bootstrap mean (500)	Original estimate	Reported SE	Difference	Critical value (5%)
Manufacturing sector	CDSO	0.049	0.049	0.002	0.0	0.0
NLDM		0.346	0.347	0.002	-0.001	-0.322
Firm size		0.221	0.221	0.002	0.0	0.0
Firm age		0.061	0.061	0.002	-0.001	-0.362
VONCN		0.216	0.215	0.002	0.001	0.739
VONQH		0.278	0.277	0.002	0.001	0.739
VONCT		0.196	0.195	0.002	0.001	0.796

VONCT		0.203	0.202	0.003	0.0	0.0
VONQH	NLDM	0.397	0.396	0.002	0.001	0.689
VONCN		0.158	0.158	0.003	0.0	0.0

(Source: Compiled by the author from data analysis results using SmartPLS)

The 500-resample bootstrap means are close to the original coefficients. This does not establish sample representativeness; the values in Table 4.13 require verification against the original SmartPLS output.

CHAPTER 5: DISCUSSION, POLICY AND MANAGERIAL IMPLICATIONS, AND CONCLUSION

5.1. Discussion of Research Findings

5.1.1. Discussion of the Effect of Innovation Capability on the Level of Digital Transformation in Accounting

5.1.2. Discussion of the Effect of Intellectual Capital on Innovation Capability

5.1.3. Discussion of the Effect of Intellectual Capital on the Level of Digital Transformation in Accounting

5.1.4. Discussion of the Mediating Role of Innovation Capability in the Relationship Between Intellectual Capital and the Level of Digital Transformation in Accounting

5.1.5. Discussion of the Results of the Control Variables

5.2. Policy and Managerial Implications

5.2.1. Implications for Policymakers and Regulatory Authorities

5.2.2. Implications for Vietnamese Manufacturing Enterprises

For policymakers, relevant directions include consistent guidance on electronic invoices and accounting documents, digital accounting and tax compliance, interoperability of legally required reporting data, and secure information exchange with digital government systems. For manufacturing enterprises, priorities include developing accounting staff competencies, improving data and cost-accounting processes, strengthening cooperation with technology partners, and implementing changes at a scale appropriate to available resources.

5.3. Contributions of the Study

5.3.1. Theoretical contributions

5.3.2. Methodological contributions

5.3.3. Contextual contributions

5.3.4. Managerial contributions

The theoretical contribution is an integrated resource–capability–outcome explanation at the accounting-function level. The methodological contribution is the separate estimation of direct and indirect relationships among the three intellectual capital components and innovation capability using PLS-SEM, without claiming a universal measurement standard. Contextually, the dissertation adds evidence from Vietnamese manufacturing enterprises. Its managerial contribution consists of practical directions for knowledge development, process integration, and innovation in accounting.

5.4. Limitations of the Study and Directions for Future Research

5.4.1. Limitations of the Study

5.4.2. Directions for Future Research

Key limitations include non-probability sampling, potential dependence among responses from the same enterprise, cross-sectional data, and the focus of some digital accounting indicators on specific technologies. Further research may employ multi-source and

longitudinal evidence, larger samples, and indicators that more directly capture production accounting processes and data integration.

5.5. Overall Conclusion

The dissertation investigates the relationships among human capital, structural capital, relational capital, innovation capability, and digital transformation in accounting in Vietnamese manufacturing enterprises. Its empirical analysis is based on 417 valid questionnaires collected from respondents in 257 enterprises and estimated using PLS-SEM.

Human, structural, and relational capital are treated as distinct dimensions of intellectual capital rather than a single estimated higher-order construct. Innovation capability is examined as a mediator, while accounting digital transformation is treated as the function-specific dependent variable. Enterprise size, age, and manufacturing sector are included as control variables.

The results indicate positive and statistically significant associations of all three intellectual capital components with innovation capability and digital transformation in accounting. Relational capital has the largest estimated relationship with innovation capability, whereas innovation capability has the largest direct coefficient among the principal explanatory constructs for accounting digital transformation. The statistically significant indirect coefficients, alongside significant direct coefficients, are consistent with complementary mediation.

The dissertation contributes to a resource–capability–outcome perspective by integrating knowledge-based resources, innovation capability, and accounting-specific digital transformation. Managerially, the findings suggest priorities in employee competencies, accounting processes and data management, external knowledge-sharing relationships, and innovation-oriented improvements. Policy implications concern digital accounting and tax compliance and secure information exchange consistent with the legal framework for digital government.

The results should be interpreted in light of the cross-sectional survey design, non-probability sampling, multiple respondents in some enterprises, and the use of several technology-specific indicators of accounting digital transformation. These limitations motivate future studies using broader and multi-source data, longitudinal designs, and measures more closely linked to manufacturing accounting practices.

Overall, the findings provide context-specific empirical evidence on the relationships between intellectual capital components, innovation capability, and digital transformation in accounting within the surveyed manufacturing enterprises. They do not, by themselves, demonstrate population-wide causal effects.

LIST OF PUBLICATIONS RELATED TO THE STUDY

[1] Khuong Huyen Duc, Do Duc Tai, Truong Duc Dinh, and Pham Khanh Huyen (2024). "The Influence of Human Capital on Financial Performance in Retail Enterprises Listed on Vietnamese Stock Exchanges." The 7th International Conference on Finance, Accounting and Auditing (ICFAA 2024), National Economics University Publishing House, pp. 1025–1042.

[2] Khuong Huyen Duc, Do Duc Tai, and Nguyen Trong Than (2025). "The influence of structural capital on financial performance in retail enterprises listed on Vietnamese stock exchanges." Journal of Finance & Accounting Research, 05(36), pp. 83–88.

[3] Khuong Huyen Duc, Do Duc Tai, and Nguyen Van Hau (2025). "The impact of intellectual capital on financial performance in information technology and telecommunications firms." Financial and Credit Activity: Problems of Theory and Practice, 4(63), pp. 264–278.

[4] Khuong Huyen Duc, Do Duc Tai, Nguyen Van Hau, Vu Quoc Dung, Pham Van Hieu, and Doan Thi Nguyet Ngoc (2026). "Research on the impact of financial and human capital use efficiency on financial performance at retail enterprises listed on the Vietnamese stock exchange." Journal of Finance & Accounting Research, 02(67), pp. 97–112.