

**MINISTRY OF EDUCATION AND TRAINING  
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**FACTORS INFLUENCING INDIVIDUALS'  
CONTINUANCE BEHAVIOR  
FOR INFORMATION TECHNOLOGY  
USAGE IN FINANCIAL STATEMENT  
AUDITING AT AUDIT FIRMS IN VIETNAM**

Major: Accounting  
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**SUMMARY OF DOCTORAL DISSERTATION  
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Scientific supervisor:

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First reviewer:.....

Second reviewer:.....

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The dissertation could be found at the following  
library:.....

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## LIST OF THE AUTHOR'S PUBLICATIONS RELATED TO THE DISSERTATION

1. **Nguyen Thi Hoang Yen & Nguyen Xuan Hung** (2024). The role of perceived information technology experience from the perspective of external auditors for satisfaction, continuance intention and continuance behavior. *Cogent Business & Management*, 12(1) . Doi: 10.1080/23311975.2024.2448280.
2. **Hung Nguyen Xuan & Yen Nguyen Thi Hoang** (2023). *Information Technology Continuance in the External Audit Profession: Evidence from Vietnam*. Volume Title: “Proceedings of the International Conference on Emerging Challenges: Strategic Adaptation in The World of Uncertainties (ICECH 2022)”(pp. 289-303). Series: Advances in Economics, Business and Management Research (AEBMR 238). Atlantis Press – now part of Springer Nature.
3. **Nguyen Thi Hoang Yen & Hung Nguyen Xuan** (2024). *The interplay between disconfirmation, perceived value, satisfaction, and continuance intention towards information technology in the external audit profession*. International Conference of Business Theories & Practices – iCOB 2024. November 2024.
4. **Nguyen Thi Hoang Yen** (2024). *Understanding the Influence of Subjective Norm on the External Auditors' Continuance Intention towards Information Technology*. 1463-1478. The 7th International Conference on Finance, Accounting and Auditing (ICFAA 2024). December 21st, 2024. Hanoi City, Vietnam.

## INTRODUCTION

### 1. Motivation

Since the 1990s, audit technology has attracted significant attention from both academia and audit firm managers (Fischer, 1996). With the advancement of Industry 4.0, the integration of humans, machines, and digital data has intensified—and auditing is no exception (Dai & Vasarhelyi, 2016; Chan et al., 2018). Information technology (IT) now influences nearly all audit stages (Bierstaker et al., 2001; Nöteberg et al., 2003), as auditors increasingly perform online procedures, integrate various applications, and work remotely when necessary (Janvrin et al., 2008; Gray et al., 2014; Tran Khanh Lam, 2025).

Auditing centers around the role of the auditor (De Beelde, 2002). Modern IT enhances flexibility but still demands compliance with professional standards (Brown-Liburd & Vasarhelyi, 2015). While positive perceptions may encourage initial behavior (Al-Ateeq et al., 2022), true effectiveness is only achieved when technology is practically adopted and sustained (Davis, 1986, 1989; Bhattacharjee, 2001). Audit firms play a supportive role in helping auditors leverage technology to improve performance and advance their careers (Tran Khanh Lam, 2025). However, a gap remains between expectations and actual practice, as tools like Excel are still more commonly used than specialized software such as ACL and IDEA (Almaqtari, 2024).

In Vietnam (VN), the auditing sector is undergoing significant digital transformation, requiring changes in mindset and processes—especially for small and medium-sized audit firms (SMEs) that often struggle with limited resources and reliance on traditional

services (VACPA, n.d.). Thus, studying the factors that influence individuals' continuance of IT usage is essential for supporting effective digital transformation. Within this context, the audit software initiative led by VACPA is viewed as a strategic solution to improve productivity and reduce costs. However, sustainable implementation requires an understanding of user behavior, forming the basis for standardization and audit quality enhancement.

Technological development has also prompted the application of behavioral psychology in auditing (Tran Khanh Lam & Nguyen Thanh Cuong, 2025). Auditor behavior is influenced by perceptions, norms, pressure, and alternative choices (Ajzen, 1971–2012). Models such as TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology) emphasize cognition, while emotions—an important factor—are often overlooked, creating a gap between intention and action (Kim et al., 2007; Fischer, 1996). Perceived behavioral control is also underexplored. As technological literacy increases, behavior evolves over time (La Barbera & Ajzen, 2021). Recent research has thus focused on the post-adoption stage using Expectation Confirmation Theory (ECT) and the Expectation-Confirmation Model (ECM) to enhance long-term IT investment effectiveness (Bhattacharjee, 2001; Mamun et al., 2020).

Based on this, the author developed an integrated model combining cognitive components from the TPB-3 (Theory of Planned Behavior) (Ajzen & Fishbein, 2005) with emotional mechanisms from ECM (Bhattacharjee, 2001), comparing it to TAM-ECM and prior research results using a balanced approach (Cooper & Richardson, 1986). The model is then adjusted and

empirically tested within audit firms in Vietnam to explain individuals' continuance behavior in using IT for financial statement auditing. This study also contributes scientifically in response to the "National Digital Transformation Program to 2025 with a vision to 2030" (Government, 2020) and the "Accounting - Auditing Strategy to 2030" (Government, 2022), in the context of the independent audit industry promoting technology adoption, legal reform, and audit quality enhancement, with VACPA as a key partner.

## **2. Research Objectives and Questions**

### ***2.1. General Objective***

To develop and empirically test a research model of factors influencing individuals' continuance behavior (IB) in financial statement auditing at audit firms in VN.

### ***2.2. Specific Objectives***

Objective [O<sub>1</sub>]: To develop a model comprising behavioral beliefs (BB), normative beliefs (NB), behavioral control (BC), intention to continue IT usage (INT), and satisfaction (SAT) that influence IB in financial statement auditing at audit firms in VN.

Objective [O<sub>2</sub>]: To empirically test the model of BB, NB, BC, INT, and SAT factors affecting IB in financial statement auditing at audit firms in VN.

### ***2.3. Research Questions***

Question [Q<sub>1</sub>]: How is the model of BB, NB, BC, INT, and SAT factors influencing IB in financial statement auditing at audit firms in VN developed?

Question [Q<sub>2</sub>]: How is the model of BB, NB, BC, INT, and SAT factors empirically tested, and which relationships (direct, mediating, moderating) are statistically significant?

### **3. Research Subjects and Scope**

#### ***3.1. Research Subject***

The subject of this dissertation is the examination of the relationships between behavioral beliefs (BB), normative beliefs (NB), behavioral control (BC), intention to continue IT usage (INT), and satisfaction (SAT) affecting individuals' continuance behavior (IB) in financial statement auditing at audit firms in Vietnam.

#### ***3.2. Research Scope***

- *Spatial scope*: All research phases of the dissertation were conducted at audit firms in Vietnam.

- *Temporal scope*: The dissertation was carried out from March 2022 to May 2025, with survey data collected between May 2024 and October 2024.

- *Scope of interview subjects*:

Group 1 – Individual interviews: 09 experts, each with over 20 years of experience at audit firms in Vietnam, holding various positions such as equity partners, CEOs/Deputy CEOs, branch directors, and members of both domestic and international professional associations.

Group 2 – Focus group interviews: 04 experts with more than 10 years of experience in IT, including at least 03 years in positions related to IT applications in auditing.

Scope of survey respondents: Individuals involved in the provision of financial statement auditing services, currently working

at audit firms or their branches in Vietnam, across various positions, including both staff and managerial levels. For brevity, the term “audit firms in Vietnam” hereafter includes their branches within the country.

#### **4. Structure of the Dissertation**

In addition to the introduction and conclusion, the dissertation is organized into five chapters as follows: Chapter 1: Research Overview; Chapter 2: Theoretical Framework; Chapter 3: Research Methodology; Chapter 4: Research Findings and Discussion; Chapter 5: Conclusion and Implications.

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### **CHAPTER 1 – RESEARCH OVERVIEW**

#### **1.1. Studies on Information Technology Usage Behavior in Financial Statement Auditing at Audit Firms**

##### ***1.1.1. Relevant International Studies***

Research on IT usage behavior in auditing has evolved progressively, addressing core issues in stages - transitioning from foundational exploration to more complex empirical modeling. In the early period (1960s–1990s), the focus shifted from audit techniques to human factors, as technology began to be adopted. This period emphasized psychological, social, and cognitive aspects, laying the foundation for the behavioral approach to technology usage. Fischer (1996) emphasized that technology is only effective when auditors actively engage with it. However, studies during this phase were mostly theoretical, lacked empirical validation, and did not clearly explain the mechanisms behind technology adoption behavior.



From the 2000s to 2010s, there was a surge in empirical research on IT usage behavior in auditing, particularly with the rise of CAATs. Models such as TAM, TPB, and UTAUT were applied to identify drivers and barriers - primarily focusing on cognitive factors. The research focus shifted from “whether to use” to “how to use effectively.” However, empirical results varied across contexts and mainly concentrated on initial acceptance, without adequately addressing continuance behavior - a key factor for digital transformation. Certain elements, such as social influence, effort expectancy, or the mediating role of intention, remained controversial. Notably, there is no strong evidence of prior studies directly investigating continuance behavior in IT usage within auditing.

Between 2020 and 2025, research on technology usage behavior in auditing witnessed strong growth, with a trend toward contextualizing influencing factors. TAM, TPB, and UTAUT models continued to evolve and were applied to explain behavior through more complex relational structures. Several studies began integrating emotional factors such as anxiety, perceived risk, attitudes, and trust—reflecting efforts to better understand subjective barriers in the audit environment. Nevertheless, most still focused on initial acceptance rather than continuance behavior, which is crucial for sustaining digital transformation.

### ***1.1.2. Relevant Domestic Studies***

Compared to global trends, research on technology usage behavior in auditing in Vietnam is still at an early stage. A notable example is the study by Trần Thứ Ba & Nguyễn Việt Hưng (2016),

which introduced the "TestBenford" software and highlighted distinct differences between manual and technology-supported audit approaches. However, the research leaned more toward technical analysis than user behavior. More recent domestic studies have been largely descriptive or qualitative in nature, lacking theoretical modeling and empirical data from audit firms, which limits their applicability and generalizability (Hoàng Thị Mai Lan & Phạm Thị Nga, 2024; Ninh Thị Thúy Ngân, 2024).

Some Vietnamese studies have begun exploring IT adoption behavior through expert interviews, identifying barriers such as limited awareness, skills, and infrastructure (Nguyễn Phương Anh, 2025), yet still lack a robust theoretical framework. Attempts to integrate UTAUT and UTAUT2 have shown that all factors positively influence intention to use (Đinh Ngọc Tú et al., 2024), but the sample was not focused on audit firms and did not reflect actual behavior. Notably, reports from VACPA and HAA (2024) indicate that auditors recognize the benefits of IT but remain concerned about legal risks and system complexity—highlighting the influence of emotions and professional perception, which have not been fully incorporated into existing models. Overall, domestic research remains largely descriptive and advisory, without developing a theoretical model that fits the Vietnamese context—an important gap that needs to be addressed.

## **1.2. Research Orientation**

### ***On the Theoretical Inheritance and Model Development***

Firstly, UTAUT has been applied to analyze IT usage behavior in specific auditing tasks (Janvrin et al., 2009b), building upon prior

empirical work (Janvrin et al., 2008). Although UTAUT integrates elements from several foundational theories, it retains only four core constructs. Meanwhile, TPB acknowledges that behavior may be influenced by emotions and is not always purely rational (Ajzen & Fishbein, 2005). Thus, UTAUT - which suits voluntary technology usage settings - may be less appropriate in audit firms where IT usage is often mandatory due to quality control or internal process requirements.

Secondly, TAM (Davis, 1989) is a foundational model in IT acceptance research, especially at the initial adoption stage. While many studies have expanded TAM by adding variables such as training, anxiety, IT knowledge, or UTAUT components, several extensions oversimplify the model by excluding the mediating roles of attitude and intention, which weakens explanatory power. Some studies have even failed to find a clear link between perceived usefulness and usage behavior (Kim et al., 2016). When TAM measures only two cognitive constructs (e.g., Hayek et al., 2022), it becomes insufficient for explaining behavior in complex contexts. Therefore, to study continuance behavior (IB), which involves experience and sustained motivation, TAM must be suitably adjusted or extended.

Thirdly, although many studies have drawn on TPB (Ajzen, 1991), few have explored the extended TPB-3 model (Ajzen & Fishbein, 2005), particularly the moderating role of behavioral control (BC) between intention and behavior. While BC is often considered a reinforcing factor for intention, its mechanism is rarely internalized by individuals (Dowling, 2009). External compliance

reflects pressure acceptance, whereas internalized control only emerges when individuals perceive it as part of their identity (Deci et al., 1994). Additionally, past behavior does not always accurately predict future behavior. Although many researchers recognize the influence of perceived BC, most treat it only as a direct predictor, without examining its moderating role.

Fourthly, although TPB is widely regarded as a rational framework for explaining behavior, its completeness remains debated. Ajzen (1991) acknowledged that the residual effect of past behavior reveals limitations in the original model—particularly the lack of emotional factors, which are often overlooked in rational models such as TPB, TAM, and UTAUT. Attitude in TPB is primarily measured cognitively (Kumari et al., 2024), whereas emotional components also have significant predictive value (Ajzen & Fishbein, 2005). Some studies, such as Kustono (2022), consider only negative emotions like anxiety as barriers, without addressing positive emotional experiences - factors that can strongly encourage continuance behavior (Mishra et al., 2023). This highlights the need to integrate emotional aspects into existing models to more accurately reflect individual behavior in technology-rich environments.

In summary, TAM and TPB are key theoretical foundations for explaining IT usage behavior, especially the link between cognition and intention. However, TAM lacks constructs for social influence and behavioral control (Abou-El-Sood et al., 2015; Kustono, 2022), while TPB does not fully capture the unique context of auditing (Dowling, 2009). This calls for model adaptation or integration

tailored to the digital transformation context of audit firms in Vietnam. Moreover, when examining continuance behavior, both cognitive and emotional factors—previously underemphasized—must be considered due to their potential significant impact (Ajzen & Fishbein, 2005).

### ***On the Contextual Specificity of the Research***

Research on IT usage behavior in auditing began in the 1990s and gradually focused on the individual level within task-specific contexts (Fischer, 1996; Janvrin et al., 2008). However, a gap remains between awareness and actual usage (Lowe et al., 2017), especially among smaller audit firms due to technological disparities, legal constraints, and a lack of detailed guidance (Austin et al., 2021). This reinforces the need for a model suitable for the local context. The dissertation was conducted in the context of Vietnamese audit firms undergoing digital transformation under national strategies (Government, 2020. 2022), as the industry promotes technology adoption and professional efficiency.

The study focuses on the post-adoption stage to assess the current situation and propose policies for improving IT application effectiveness in financial statement auditing.

Based on this, the author develops and tests a new model derived from behavioral theory, reflecting both actual usage and post-experience IT perceptions. The model integrates cognitive beliefs and positive emotions to explain continuance behavior in IT usage among auditors at audit firms in Vietnam.

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## **CHAPTER 2 – THEORETICAL FRAMEWORK**

### **2.1. Key Research Concepts**

#### ***2.1.1. Financial Statement Auditing***

According to Vietnamese Standard on Auditing (VSA) 200, financial statement auditing is defined as the process by which “the auditor expresses an opinion on whether the financial statements are prepared, in all material respects, in accordance with the applicable financial reporting framework.” To form a reliable opinion, the audit must be conducted in accordance with VSAs and relevant ethical requirements (Ministry of Finance, 2012, 2015). Additionally, pursuant to the Law on Independent Audit No. 67/2011/QH12, financial statement auditing refers to the process in which practicing auditors, audit firms, or branches of foreign audit firms in Vietnam inspect and express opinions on the truthfulness and fairness of financial statements, in material respects, in accordance with audit standards (National Assembly, 2011). Despite varying wordings, these definitions converge on the same essence. Accordingly, in this dissertation, “financial statement auditing” refers to statutory audits - reasonable assurance services provided by audit firms under legal mandates.

#### ***2.1.2. Individual Behavior in Continuing Information Technology Use***

Individual behavior is a core focus in audit research and is influenced by rationality, expectations, and contextual factors (Ajzen, 1985–2015). Individuals may exhibit either Type A behavior (ambitious, stress-tolerant) or Type B (relaxed, flexible) (Friedman & Rosenman, 1974). In high-pressure environments, Type A auditors

tend to achieve higher performance and satisfaction (Gundry & Liyanarachchi, 2007). Behavior also varies by age: younger professionals face career-building pressures, while mid-career individuals are challenged by adapting to new technologies (Ross, 2021). Despite assumptions, studies show no significant differences in skill levels across age groups (Ross, 2021). Managing individual diversity remains a key challenge in the profession.

Continuance behavior (IB) in this study is regarded as a rational behavior formed after the initial acceptance stage, shaped by actual experience and usage context (Ajzen, 1991, 2001; Bhattacharjee, 2001). When conditions are stable, past behavior becomes a reliable predictor of future behavior (Ajzen, 2005). IB reflects actual commitment to technology, driven not only by initial perceptions but also by ongoing motivation. This behavior adheres to the principle of compatibility across goals, actions, contexts, and time (Ajzen, 2005). In auditing, IT serves as a support tool for task execution, enhancing efficiency and professional capacity (Elliott & Jacobson, 1987; Fischer, 1996).

### ***2.1.3. Intention to Continue Using Information Technology***

The intention to continue using IT (INT) is a direct predictor of behavior (IB), yet it does not always lead to actual usage due to interference from alternative goals, external conditions, or social influences (Ajzen & Fishbein, 1970; Ajzen, 1985). Intentions may also change over time—the longer the gap between intention and behavior, the higher the risk of discontinuity. Therefore, individuals may fail to follow through on their intention to use IT if necessary resources are lacking.

#### ***2.1.4. Behavioral Beliefs***

Behavioral beliefs (BB) refer to personal evaluations of potential outcomes from performing a behavior (Ajzen & Fishbein, 1980, 2005). When perceived benefits outweigh drawbacks, individuals are more likely to form positive evaluations. BB in this dissertation refers to the extent to which individuals in audit firms perceive the potential outcomes of continuing IT use in financial statement auditing (Ajzen & Fishbein, 2005).

#### ***2.1.5. Normative Beliefs***

In social contexts, individuals often consider the opinions of important others before acting (Rossi, 2021). Such beliefs form subjective norms, which influence decisions to engage in or avoid a behavior (Ajzen & Fishbein, 1980). Normative beliefs (NB) here are defined as an individual's assessment of perceived expectations from influential figures regarding their continuance of IT use in financial statement auditing (Ajzen & Fishbein, 2005).

#### ***2.1.6. Perceived Behavioral Control***

Depending on the context, individuals evaluate different enablers or barriers to behavior (Rossi, 2021). These evaluations form control beliefs, which are the foundation of perceived behavioral control (BC), akin to perceived self-efficacy (Ajzen, 1985, 2015). When individuals believe they possess sufficient skills and resources to overcome obstacles, their perceived control strengthens. In situations where behavior is not entirely volitional, BC may represent actual control, improving behavioral prediction (Ajzen & Fishbein, 2005). BC in this research includes both internal control



and external resources required to continue IT use in financial statement auditing.

### ***2.1.7. Satisfaction***

Satisfaction (SAT), commonly defined as a person's perceived reaction to the degree to which a product or service experience meets, exceeds, or falls short of expectations, is a crucial factor in customer retention and cost reduction (Oliver, 2015; Dabholkar et al., 2000). Oliver (2015) emphasized that satisfaction should be measured using performance-based criteria rather than generic definitions, to ensure meaningful interaction among constructs in research.

### ***2.2. Relationship Between TPB, TAM, and ECM***

This study adopts the balanced approach proposed by Cooper and Richardson (1986) to avoid “unfair comparison” between TAM-ECM and TPB. For a valid theoretical comparison, two conditions of “equivalent strength” must be met: (1) procedural equivalence – all theories must be implemented with equal levels of rigor, reliability, and respect for boundary conditions; (2) Distributional equivalence – measurement items must demonstrate comparable representation and empirical validity in relation to the research population.

*First*, the study compares debates surrounding TPB, from Ogden's (2003) critiques to Ajzen & Fishbein's (2004) rebuttals. While some argue TPB lacks emotional constructs (Sniehotta et al., 2014), Ajzen has consistently stated that TPB is an open model, allowing for new variables when designed appropriately (Ajzen, 2001, 2005, 2012). TPB does not assume that behavior is always rational or that beliefs are always objective - it accommodates even

irrational beliefs in decision-making. Hence, dismissing TPB without fair empirical testing is unconvincing. Nonetheless, a key limitation remains: TPB does not fully explain the role of emotion in forming intention and behavior.

*Second*, TPB - rooted in behavioral psychology - predicts deliberate behavior based on behavioral, normative, and control beliefs, with intention as a mediating factor. In contrast, TAM explains technology usage based on perceived usefulness and ease of use. Both models assume attitudes derive from beliefs; however, TPB emphasizes contextual influences, while TAM focuses on system characteristics. Although TAM is suited for early adoption phases, its two core beliefs fall short in explaining sustained usage. Later extensions such as TAM-2, TAM-3, and UTAUT, though based on TPB/TRA foundations, still do not sufficiently explain long-term continuance behavior.

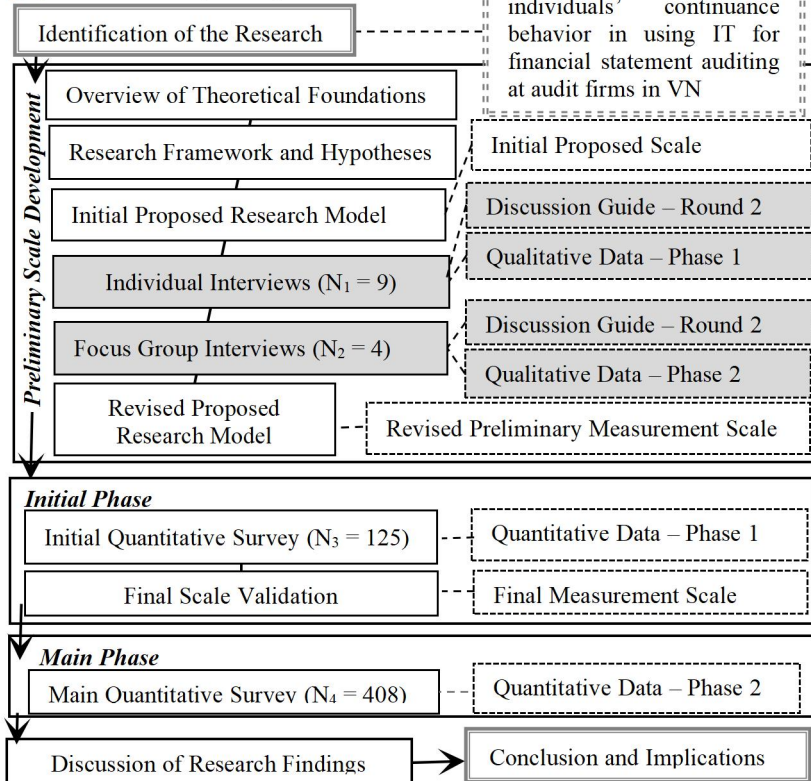
*Third*, initial technology acceptance behavior is often driven by expectations and perceptions (TAM), whereas continuance behavior depends on actual experience and perceived benefits—explained by Expectation Confirmation Theory (ECT) and the Expectation Confirmation Model (ECM) (Oliver, 1980; Bhattacharjee, 2001). ECM, an adaptation of ECT for IT contexts, emphasizes the roles of satisfaction and perceived post-usage usefulness while eliminating attitude as a mediator (Bhattacharjee et al., 2008). Ajzen & Fishbein (2004) also suggested that belief constructs may vary by behavior and context. Therefore, ECM is suitable for explaining continuance behavior, particularly in post-experience IT usage contexts.

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## CHAPTER 3 – RESEARCH METHODOLOGY

### 3.1. Research Process

Guided by a pragmatic epistemology, the author introduced the sequential mixed-methods design combining both qualitative and quantitative approaches (Trochim et al., 2016) in the introductory section, as illustrated in Figure 3.1. This approach emphasizes the practical value of scientific knowledge for stakeholders, aligning with the recommendations by Creswell & Clark (2007, as cited in Nguyen Dinh Tho, 2013).



**Figure 3.1. Research Process of the Dissertation**

At the same time, this type of mixed-method design has gained widespread acceptance among qualitative researchers. To comprehensively explore the multidimensional aspects of the dissertation's design, the author adopts and elaborates on the research approach based on the "triangulation" technique proposed by Olsen (2004, as cited in Ly Thi Minh Chau et al., 2024).

### **3.2. Research Methodology**

The author employed a combination of qualitative and quantitative research methods using a sequential mixed-methods design throughout the research process.

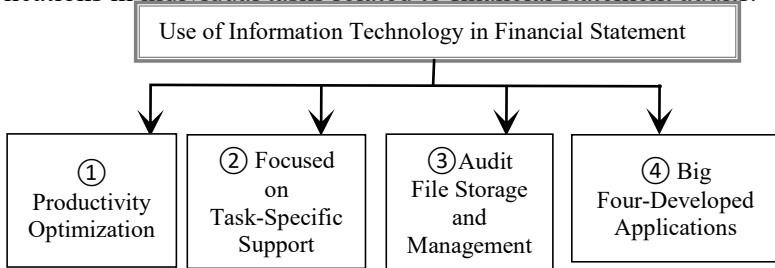
***Qualitative approach:*** The qualitative method was implemented through the collection, analysis, synthesis, and comparison of relevant documents to build the literature review, establish the theoretical foundation, and propose the initial research model. Subsequently, the author conducted individual interviews at audit firms and focus group discussions with IT experts using a semi-structured questionnaire. The resulting data were analyzed to refine the measurement scales and develop hypotheses for the quantitative phase. In addition, inductive reasoning and abstraction techniques were applied to derive theoretical and practical implications relevant to the research context.

***Quantitative approach:*** The quantitative method was conducted in two phases - preliminary and main - to test the research hypotheses. This involved using analytical techniques such as Cronbach's Alpha for scale reliability, Exploratory Factor Analysis (EFA), and Partial Least Squares Structural Equation Modeling (PLS-SEM), executed through the SmartPLS software.

## CHAPTER 4 – RESEARCH FINDINGS

### 4.1. Current Status of Information Technology Usage Among Individuals Working at Audit Firms in Vietnam

After coding keywords, phrases, and narrative segments from the qualitative interview data ( $KiT_{i=1}^{n=9}$ ), the author grouped them into a categorized list of commonly used IT items, organized by thematic applications in individual tasks related to financial statement audits.



**Figure 4.1. Thematic Categories of IT Applications Used by Individuals at Audit Firms in VN for Financial Statement Auditing**

At the same time, the author conducted a survey to assess the frequency and proficiency of IT usage in financial statement auditing (Table 4.1).

**Table 4.1. Frequency and Proficiency of IT Application Usage**

Some IT Applications Used in Audit Firms in VN	No ①	Yes ☑	% ☑	Average Usage Frequency	Average Proficiency Level
<i>Focused on Task-Specific Support</i>					
<i>1.1. Office Applications</i>					
Microsoft Excel	0	408	100.00	4.81	4.96
WPS Spreadsheets	125	283	69.36	4.82	4.48
Google Sheets	81	327	80.15	3.94	4.01
Microsoft Word	0	408	100.00	4.78	4.81
WPS Document	105	303	74.27	4.57	4.31
Google Docs	0	408	100.00	3.96	4.02
PowerPoint	0	408	100.00	4.07	4.01

<b>Some IT Applications Used in Audit Firms in VN</b>	<b>No ①</b>	<b>Yes ☑</b>	<b>% ☑</b>	<b>Average Usage Frequency</b>	<b>Average Proficiency Level</b>
WPS Presentation	219	189	46.32	3.67	3.84
Google Slides	275	133	32.60	3.37	3.26
<b>1.2. Advanced Analytics and Audit Automation Applications</b>					
ACL	407	1	0.25	3.00	2.00
CaseWare IDEA	401	7	1.72	3.14	2.71
Power BI	351	57	13.97	3.58	3.47
Reveal	408	0	0.00		
TeamMate Analytics	408	0	0.00		
<b>2. Audit File Storage and Management</b>					
CaseWare Working Papers	402	6	1.47	3.17	2.33
CaseWare Cloud	405	3	0.74	3.00	2.00
DMS	408	0	0.00		
Google Drive	0	408	100.00	4.49	4.75
Sever/Offsite	4	404	99.02	4.48	4.88
General Audit Firm Software	305	103	25.25	4.86	4.14

#### 4.2. Qualitative Research Findings

All measurement scales: BB (Behavioral Beliefs), NB (Normative Beliefs), SAT (Satisfaction), INT (Intention), BC (Behavioral Control), and IB (IT Usage Behavior) were refined in terms of language and phrasing, based on expert feedback and professional standards. Except for SAT and IB, which had one indicator removed each (SAT4 and IB7), the remaining four scales retained their original number of observed variables. The qualitative study contributed to the development of the second version of the preliminary measurement scale and the revision of the quantitative questionnaire.

The findings not only clarified expert perceptions of the factors influencing IT usage behavior (IB), but also led to the identification of a new hypothesis: behavioral control (BC) may not only affect the INT–IB relationship but may also moderate the effect of satisfaction

(SAT) on IB (hypothesis H5b), which will be tested in the quantitative phase. In total, 11 hypotheses were formulated for the research model.

### **4.3. Official Quantitative Research Findings**

#### ***4.3.1. Sample Characteristics***

The official quantitative analysis was based on a dataset of  $N_4 = 408$  respondents.

In terms of gender, 52.70% were male and 47.30% female. The largest age group was 30–39 years, accounting for 51.23% of the sample. Regarding professional experience, most respondents had 6–10 years of experience (42.89%), followed by 3–5 years (21.32%), 11–20 years (16.91%), less than 3 years (12.75%), and more than 20 years (6.13%). The sample included various position levels: those directly involved in audit execution and review (assistants, auditors, team leaders) accounted for 11.03% to 26.72%, with licensed auditors being the largest group. Senior management positions (equity partners, directors, department heads, etc.) ranged from 1.96% to 7.84%.

#### ***4.3.2. Measurement Model Evaluation***

*Assessment of Internal Consistency Reliability:* The values of Cronbach's Alpha and Composite Reliability (CR) for all constructs fall within the range of 0 to 1. CR, which is considered the primary indicator of internal consistency, was used in combination with Cronbach's Alpha to ensure a more accurate assessment of reliability. Specifically, CR values ranged from 0.777 to 0.899, which are acceptable since none exceeded the 0.9 threshold.

*Assessment of Convergent Validity:* Based on Hair et al. (2019), convergent validity was evaluated using the Average Variance Extracted (AVE) to determine whether items of a given construct converge meaningfully. The AVE values ranged from 0.538 to 0.641, indicating satisfactory convergent validity as all values exceeded the recommended minimum of 0.5.

*Assessment of Discriminant Validity:* Discriminant validity was evaluated using cross-loadings, where each indicator showed the highest loading on its respective construct, consistent with Hair et al. (2019). The Fornell–Larcker criterion was also satisfied, as the square root of AVE for each construct exceeded its correlations with other constructs. Additionally, the Heterotrait–Monotrait ratio (HTMT) values were all below the 0.9 threshold, confirming strong discriminant validity between constructs.

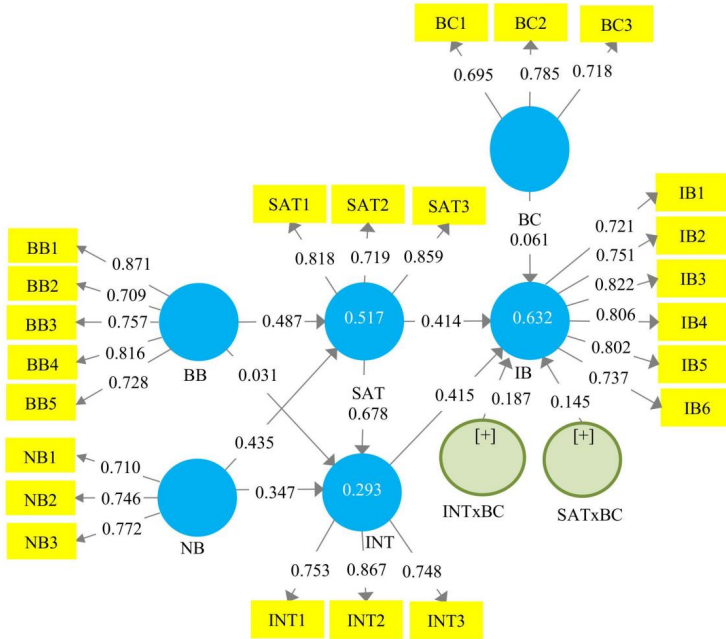
#### ***4.3.3. Structural Model Evaluation***

*Assessment of Collinearity Issues:* In the first step of structural model evaluation, all Variance Inflation Factor (VIF) values were within the acceptable range, as recommended by Hair et al. (2019). The highest VIF value observed was 2.304 for item IB5, which is still below the commonly accepted threshold of 3. All latent constructs also showed  $VIF < 3$ , indicating no serious multicollinearity issues. Thus, the model satisfies the first condition and is suitable for further analysis.

*Testing the Hypothesized Relationships in the Structural Model:* The path coefficients estimated using the PLS-SEM algorithm quantified the hypothesized relationships between constructs. The results showed that all direct and interaction effects were statistically



significant. In particular, the paths  $SAT \rightarrow INT$ ,  $BB \rightarrow SAT$ ,  $NB \rightarrow SAT$ ,  $NB \rightarrow INT$ , and  $INT \rightarrow IB$  exhibited strong and meaningful effects.



**Figure 4.1. Model Estimation Results  
with the Moderating Variable (BC)**

Furthermore, as shown in Figure 4.1, the moderating effect in the PLS path model also includes a direct relationship from BC to the endogenous variable IB. In addition to the direct effects indicated by the path coefficients, hypotheses H1a, H1b, H2a, H2b, H3a, H3b, and H4 were supported, with all showing statistical significance ( $p < 0.01$ ). Moreover, the presence of the moderating variable BC in the measurement model demonstrates that the relationships  $INT \rightarrow IB$  and  $SAT \rightarrow IB$  are strengthened, as evidenced by the interaction

terms  $INT \times BC$  and  $SAT \times BC$ , with coefficients of 0.187 and 0.145, respectively. Therefore, hypotheses H5a ( $\beta_{sa} = 0.187$ ;  $t = 3.042$ ;  $p < 0.01$ ) and H5b ( $\beta_{sb} = 0.145$ ;  $t = 2.986$ ;  $p < 0.05$ ) concerning the moderating role of BC are accepted. In addition, all three hypotheses H6a, H6b, and H6c were supported, confirming the existence of partial positive mediation in the relationships, as both the direct effects (☑) and indirect effects (※) were statistically significant and positive (see Table 4.2).

**Table 4.2. Hypothesis Testing for Mediating Effects**

Hypothesis	Relationship		t value	Significance Level (p<0.01)	Notes
H6a	BB→INT	0.031	7.735	Yes	☑
	BB→SAT→INT	0.330	9.905	Yes	※
H6b	NB→INT	0.347	6.275	Yes	☑
	NB→SAT→INT	0.295	9.015	Yes	※
H6c	SAT→IB	0.414	6.680	Yes	☑
	SAT→INT→IB	0.281	6.633	Yes	※

❖ *Assessment of Structural Model Acceptance*

**Table 4.3. Coefficients of Determination ( $R^2$ ) and  $R^2_{adj}$  Values**

Endogenous Variable	$R^2$	$R^2_{adj}$
SAT	0.517	0.516
INT	0.293	0.291
IB	0.632	0.627

❖ *Assessment of Model Strength*

**Table 4.4.  $f^2$  Effect Size Coefficients**

	SAT	INT	IB	Assessment of Effect Size
BB	0.285			Above Average
NB	0.020			Very Weak
BB		0.045		Very Weak
NB		0.270		Above Average
SAT		0.115		Weak to Moderate
SAT			0.165	Moderate
INT			0.170	Moderate
BC			0.004	Very Weak

	SAT	INT	IB	Assessment of Effect Size
INTxBC			0.032	Weak
SATxBC			0.121	Weak

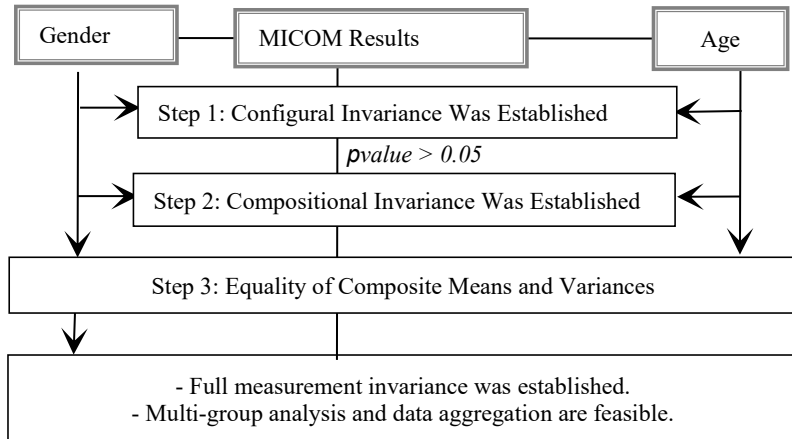
❖ *Assessment of Predictive Relevance*

**Table 4.5. Q<sup>2</sup> Effect Size Coefficients**

Endogenous Variable	Q <sup>2</sup> values	Assessment of Effect Size
SAT	0.315	Above Average
INT	0.178	Moderate
IB	0.402	Large

**4.3.4. Measurement Invariance Assessment and Multi-Group Analysis**

❖ *Measurement Invariance Assessment:* The MICOM procedure (Figure 4.2) confirmed that the condition of full measurement invariance was satisfied.



**Figure 4.2. Summary of MICOM Results**

❖ *Multi-group analysis:* To assess overall differences in path coefficients between specific groups, the author employed permutation tests. The results revealed no significant differences between the two gender groups. However, two statistically significant differences ( $p < 0.05$ ) emerged between the two age

groups (Younger vs. Older). Specifically, the effect of SAT  $\rightarrow$  IB was stronger among younger individuals ( $\beta = 0.604$ ) than older ones ( $\beta = 0.354$ ); conversely, the effect of INT  $\rightarrow$  IB was higher in the older group ( $\beta = 0.407$ ) compared to the younger group ( $\beta = 0.189$ ).

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## **CHAPTER 5 – CONCLUSION AND IMPLICATIONS**

### **5.1. Conclusion**

Although many experts agree that auditors increasingly need to use IT in their work (Crookes & Conway, 2018) due to its efficiency benefits (Curtis et al., 2009), audit firms have yet to fully implement IT, particularly computer-assisted techniques (Ahmi & Kent, 2013). IT only becomes effective when it is actually used (Fischer, 1996), while continuance behavior (IB) depends heavily on contextual factors. Digital transformation compels audit firms to strengthen their technological adoption, but success requires not only initial acceptance but also long-term use - something that models like TAM and UTAUT do not fully explain.

In response, the author developed and tested a research model that clearly identifies the factors influencing continuance behavior of IT usage in audit firms in Vietnam. The findings expand the understanding of individual behavior in digital auditing, support predictions about technology implementation effectiveness, and propose appropriate interventions. This research provides strong justification for [Q<sub>1</sub>], [Q<sub>2</sub>], contributing to mindset development, training improvement, and future research orientation. At the same time, it offers practical value for the industry, promoting professionalism and integration in the digital transformation process.

## **5.2. Contributions of the thesis**

### ***5.2.1. Theoretical contributions***

The author develops an integrated model of the Theory of Planned Behavior (TPB-3) and the Expectation-Confirmation Model (ECM), based on the balancing approach of Cooper & Richardson (1986), to explain the continuance intention of using IT in financial statement audits at audit firms in Vietnam. The model combines rational factors (from TPB) with emotional factors (Satisfaction from ECM), thereby overcoming the limitations of each individual theory.

The research findings confirm the mediating roles of Satisfaction (SAT) and Intention (INT), along with the moderating role of Behavioral Control (BC) in the relationships between SAT–Continuance Behavior and INT–Continuance Behavior. Furthermore, a multi-group analysis reveals psychological differences based on career stages: younger professionals are more influenced by emotional factors, while mid-career professionals rely more on rational factors. This is the first empirical study in Vietnam to test this integrated model in this specific field. It provides a scientific basis for policymaking, training, and IT application tailored to the unique characteristics of the audit industry and the current context of digital transformation.

### ***5.2.2. Practical implications***

*Firstly*, for individuals working at audit firms: Professionals should enhance their awareness of technology's role, develop a personal IT skills roadmap, and participate in regular training. They should proactively choose work environments with strong technology innovation policies, consistently practice using data

analysis tools, and stay updated on new trends to adapt to and drive the industry's digital transformation.

*Secondly*, for audit firms: Firms need to implement a strategic IT application roadmap with the following steps: (i) assess their current status and needs based on size and specialization; (ii) identify suitable technologies, build a portfolio of applications, and establish KPIs and efficiency criteria; and (iii) provide stratified training tailored to employees' age, position, and technological awareness. This strategy must be user-centric, combined with investment in security infrastructure, and include periodic assessments of user satisfaction.

*Thirdly*, for the Vietnam Association of Certified Public Accountants (VACPA): VACPA should update the Sample Audit Program for financial statement audits and issue guidelines for technology-integrated auditing. It should also contribute to refining the model Quality Control Regulation by emphasizing enhanced security and the assignment of personnel based on their cognitive and emotional responses to technology. Furthermore, VACPA needs to increase IT training for auditors, collaborate with large audit firms to design relevant programs, and keep members updated on the latest audit technologies.

*Fourthly*, for the Ministry of Finance: The Ministry should refine the legal framework for IT application in auditing, with a special focus on data security, legal liability, and promoting continuance intention as Vietnam aligns with international standards. Additionally, it should encourage the development of common audit software for small and medium-sized audit firms to ensure

consistency, efficiency, and feasibility in quality management across the industry.

### **5.3. Research Limitations and Future Directions**

To put these results into the proper perspective, several particularly important limitations of this thesis should be addressed.

(1) The study used a convenience sample with a size suitable for PLS-SEM (Hair et al., 2019). However, survey accessibility was limited by industry-specific barriers such as confidentiality (Fischer, 1996). This suggests that future research could consider expanding the scope to enhance generalizability while maintaining cost-effectiveness.

(2) The self-reported assessment of IT usage levels may be influenced by subjective perceptions. The levels of trust and continuance intention (IB) can vary depending on the context, especially in smaller audit firms with limited technological infrastructure and specialized training. Subsequent research could differentiate the context of IT usage to re-validate the model.

(3) The continuance intention of using IT is also governed by practical constraints such as audit fees, IT support commitments in audit contracts, and technological disparities between audit firms and their clients (Austin et al., 2021). Long-term IT investment is also affected by negotiating power and the balance of interests between parties. This is a potential research direction that needs to be explored more deeply in the future.

### **REFERENCES**

The full content is presented in the official version of the thesis.