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THE IMPACT OF DIGITAL TRANSFORMATION LEADERSHIP ON EMPLOYEE DIGITAL INNOVATION BEHAVIOR: AN EMPIRICAL STUDY IN VIETNAM'S TRANSPORTATION AND LOGISTICS SECTOR

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CHAPTER 1: GENERAL INTRODUCTION TO THE RESEARCH

1.1. REASONS FOR CHOOSING THE TOPIC

1.1.1. Practical Context

The Industry 4.0 era requires businesses to undergo comprehensive digital transformation in both technology and organizational culture. In Vietnam, Resolution 57-NQ/TW (December 22, 2024) by the Politburo identifies digital transformation as the "top breakthrough priority" for economic and social development in the new era.

Vietnam's transportation and logistics sector is growing rapidly with a scale of 40-42 billion USD, a growth rate of 14-16% per year, and more than 300,000 operating businesses (Ministry of Industry and Trade, 2024). However, 95.2% are small and micro enterprises (Institute of Statistical Science, 2022). According to Ho Minh Son (2024), 68% of logistics companies have implemented digital technology. Yet, the 2023 Logistics Report shows that 90.5% are still at the basic digitalization stage, with only 0.4% reaching the highest adaptation level (Information and Communication Technology Magazine, 2024).

The biggest challenge is human resources: only 5-7% of the 1.2 million workers have specialized training, while the projected demand is 2.5 million by 2030 (Ministry of Industry and Trade, 2024). McKinsey research (2023) shows that when leaders actively guide digital transformation, the success rate increases by 2.1-3.1 times (Pham Ngoc Toan, 2025).

The government has set targets for 2035: 80% of businesses applying digital solutions, 70% of workers receiving professional training, and logistics costs/GDP reduced to 12-15% from the current 18% (Phan Trang, 2024). To achieve these goals, the leadership role in developing digital capabilities and promoting innovative behavior among employees becomes crucial.

1.1.2. Theoretical Context

Digital innovation behavior means building and using modern technology solutions at work. It is very important for successful digital

transformation (Nambisan et al., 2017). However, this is a new research area. Only 29 studies about employees' digital innovation behavior have been published since 2019. Digital transformation leadership is important for promoting this behavior. But there are only 13 studies about it since 2020.

Current studies have found many factors that affect digital innovation behavior. At the personal level, these include innovative personality and psychological capital. At the organizational level, they include innovation culture and psychological safety. However, we still do not clearly understand how digital transformation leadership works. We need to know more about how it affects knowledge-sharing environment, organizational agility, digital competence, and employee attitudes. Also, the role of generational differences has not been fully studied. Different generations have different attitudes and behaviors with technology. This is an important gap.

Based on the practical and theoretical context analyzed above, the author has decided to select the research topic: ***"The impact of digital transformation leadership on employees' digital innovation behavior: An empirical study in the transportation and logistics sector in Vietnam"***.

1.2. RESEARCH OBJECTIVES

1.2.1. General Objective

The general objective of this dissertation is to examine the impact of digital transformation leadership on the digital innovation behavior of employees in transportation and logistics in Vietnam. Based on the research results, the study proposes managerial implications to enhance employees' digital innovation behavior, thereby meeting the demand for quality human resources in the context of digital transformation in Vietnam's transportation and logistics sector.

1.2.2. Specific Objectives

(1) Develop a theoretical framework on the impact of digital transformation leadership on the digital innovation behavior of transportation and logistics employees in Vietnam.

(2) Evaluate the direct influence of digital transformation leadership on knowledge-sharing environment, organizational agility, digital competence, and attitude toward digital transformation among transportation and logistics employees in Vietnam.

(3) Evaluate the mediating role of knowledge-sharing environment and organizational agility in the relationship between digital transformation leadership and digital competence of transportation and logistics employees in Vietnam.

(4) Evaluate the relationship between digital competence, attitude toward digital transformation, and digital innovation behavior of transportation and logistics employees in Vietnam.

(5) Evaluate the moderating role of generation in the relationship between digital competence and digital innovation behavior, and between attitude toward digital transformation and digital innovation behavior.

(6) Propose managerial implications to enhance the digital innovation behavior of transportation and logistics employees in Vietnam.

1.3. RESEARCH QUESTIONS

(1) Based on foundational theories and the review of previous studies, what theoretical framework on the impact of digital transformation leadership on employees' digital innovation behavior would be appropriate and contribute to filling the research gap?

(2) Does digital transformation leadership have a direct influence on knowledge-sharing environment, organizational agility, digital competence, and attitude toward digital transformation among transportation and logistics employees in Vietnam?

(3) Do knowledge-sharing environment and organizational agility play a mediating role in the relationship between digital transformation leadership and digital competence of employees in transportation and logistics in Vietnam?

(4) What is the relationship between digital competence, attitude toward digital transformation, and digital innovation behavior of transportation and logistics employees in Vietnam?

(5) Does generation play a moderating role in the relationship between digital competence and digital innovation behavior, and between attitude toward digital transformation and digital innovation behavior?

(6) What managerial implications can be proposed to enhance the digital innovation behavior of transportation and logistics employees in Vietnam?

1.4. RESEARCH OBJECT AND SCOPE

1.4.1. Research Object

Study the impact of digital transformation leadership on digital innovative behavior of employees in Vietnam's transportation and logistics industry, considering factors including knowledge-sharing environment, organizational agility, digital competence, attitude toward digital transformation, and generation.

1.4.2. Research Scope

a. Time scope: The research is conducted from October 2024 to September 2025. Expert interviews and employee discussions (November 2024 to December 2024), Pilot quantitative survey (January 2025 to February 2025). Official quantitative survey (April 2025 to May 2025)

b. Research location: The transportation and logistics enterprises in Vietnam, specifically in major provinces and cities including Hanoi, Hai Phong, Da Nang, Dong Nai, Binh Duong[1], and Ho Chi Minh City.

- Interview participants: Lecturers, researchers, middle and senior managers of transportation and logistics enterprises.

- Group discussion and survey participants: Employees of transportation and logistics enterprises.

[1] Binh Duong Province merged with Ba Ria - Vung Tau Province and Ho Chi Minh City, taking the name Ho Chi Minh City from July 1, 2025, according to Resolution No. 60-NQ/TW dated April 12, 2025, of the 11th Conference of the 13th Central Executive Committee of the Party.

1.5. RESEARCH METHOD

The study uses a mixed-methods approach, combining qualitative and quantitative research. The qualitative phase includes interviews with 15 experts and group discussions with 30 employees. The quantitative phase is carried out in two steps: preliminary study and main study.

1.6. SIGNIFICANCE OF THE RESEARCH

1.6.1. Theoretical Significance

The research proposes and tests an integrated model that examines the impact of digital transformation leadership on digital innovative behavior through organizational factors (knowledge sharing environment, organizational agility) and individual factors (digital competence, attitude toward digital transformation). Generational differences in the relationships between digital capability/attitude toward digital transformation and digital innovative behavior are also explored.

1.6.2. Practical Significance

The research results propose management implications to promote employees' digital innovative behavior through digital transformation leadership, knowledge sharing environment, organizational agility, and employees' digital competence. Generation is identified as an important factor to consider when implementing solutions. Additionally, the research results provide a scientific basis for policy planning to develop the transportation and logistics industry toward digitalization and innovation in the context of Industry 4.0.

1.7. STRUCTURE OF THE DISSERTATION

Besides the introduction, conclusion, appendices, and references, the dissertation consists of 5 chapters: Chapter 1: General Introduction; Chapter 2: Theoretical Foundation and Research Model; Chapter 3: Research Design; Chapter 4: Research Results; Chapter 5: Conclusion and Management Implications.

CHAPTER 2: THEORETICAL FOUNDATION AND RESEARCH MODEL

2.1. RESEARCH CONCEPTS

2.1.1. Digital Transformation Leadership

Digital transformation leadership is a leadership style focused on changes in processes, structure, and organizational culture by leveraging advanced digital technologies (Ly, 2024). Digital transformation leadership does not stop at applying modern technology; digital transformation leadership must shape digital thinking throughout the organization, including both leadership and employees (Hinings et al., 2018).

2.1.2. Digital Inovative Behavior

Employee innovative behavior refers to behaviors related to creating or applying new ideas and efforts to perform work (Lukes and Stephan, 2017). It includes 6 core elements: idea generation, idea search, idea communication, implementation starting activities, involving others, and overcoming obstacles. Based on the concept of employee innovative behavior, digital innovative behavior can be understood as activities aimed at developing and implementing advanced technology ideas and solutions in the work environment. According to Nambisan et al. (2017), digital innovation is not just about applying new technology, but also requires changes in perception and operating methods to maximize the benefits that digital technology brings.

2.1.3. Knowledge Sharing Environment

According to Lin (2007), knowledge sharing environment refers to social interactions related to exchanging knowledge, experience, and expertise of employees across all departments in the organization. It is not just knowledge exchange between members, but a systematic activity that connects the entire organization.

2.1.4. Organizational Agility

Organizational agility was defined by Brown and Agnew (1982) as the organization's ability to respond quickly to changing circumstances. More

broadly, organizational agilityis seen as a set of essential capabilities that help organizations adapt and thrive in changing environments, while turning challenges into potential business opportunities (Walter, 2021).

2.1.5. Digital Competence

In today's rapidly developing digital age, digital competences are becoming an important requirement for workers, especially those who frequently interact with digital devices and tools (Janssen et al., 2013; Oberländer et al., 2020; Heponiemi et al., 2022). Digital competence in the work environment is a combination of knowledge, skills, abilities, and necessary characteristics (KSAO) that help employees effectively use digital tools to complete tasks (Guzmán-Simón et al., 2017; Oberländer et al., 2020).

2.1.6. Attitude Toward Digital Transformation

Attitude is the conscious or unconscious evaluation that individuals show when exposed to objects, from tangible and familiar elements like things and people to abstract concepts and complex ideas (Barrutia and Echebarria, 2021). Attitude toward digital transformation can be understood as an individual's positive or negative evaluation of the digitalization process in the work environment (Meske and Junglas, 2021).

2.2. THEORETICAL FOUNDATIONS

2.2.1. Knowledge-Based Theory

According to Grant (1996), knowledge is the strategic resource of enterprises, where the main role of the organization is to integrate individual specialized knowledge to create value through producing goods and services. The focus of knowledge-based theory is knowledge application, rather than knowledge creation, with the assumption that knowledge resides in individuals and is not easily transferable. Knowledge is divided into two main types: explicit knowledge, which can be easily coded and transmitted, and tacit knowledge, which requires practice and interaction to transfer (Kogut and Zander, 1992). In this research, knowledge-based theory is applied as the main theoretical foundation to explain the relationships

between digital transformational leadership, knowledge sharing environment, and organizational agility.

2.2.2. Social Learning Theory

Social learning theory refers to the role of observation and modeling of others' behaviors, attitudes, and emotional reactions in the learning process (Bandura, 1977). The central concept of social learning theory is modeling - a learning mechanism that allows individuals to acquire new behaviors through observing and imitating others' behavioral expressions (Hill et al., 2009; Ahn et al., 2020). In this research, social learning theory is applied to explain the mechanism of developing digital competence and digital inovative behavior of employees through social interaction and organizational environment.

2.2.3. Theory of Planned Behavior

Proposed by Ajzen in 1985, the theory of planned behavior is a theoretical model to predict planned and intentional human behaviors (Ajzen, 1985). According to TPB, each individual's intention to perform behavior is based on three main factors: "attitude toward behavior," "subjective norm," and "perceived behavioral control." In this research, "perceived behavioral control" in TPB is clearly reflected through the digital competence variable, "attitude toward behavior" is reflected through the attitude toward digital transformation variable, and "subjective norm" is reflected through the influence of digital transformational leadership on employee attitudes.

2.3. LITERATURE REVIEW

2.3.1. Studies on Digital Transformation Leadership

In the Scopus database, using the keyword "digital transformational leadership," 13 documents were found. The first document was published in 2020. This suggests that "digital transformational leadership" has recently emerged as a potential research direction.

Content analysis results from 12 studies on digital transformation leadership show that digital transformation leadership plays a key role and has a positive impact on organizations' digital transformation process. This is clearly demonstrated through digital transformation leadership's ability to promote organizational digital competence, create digital mindset and culture, and stimulate employees' creative thinking and improvement. Additionally, studies by Ly (2024) and AlNuaimi et al. (2022) indicate that digital transformation leadership also has a positive impact on important mediating factors such as organizational adjustment and adaptation capabilities, thereby creating the foundation for successful digital transformation.

2.3.2. Studies on Innovative Behavior

The author searched the Scopus database using the keyword phrase "innovation behavior" in the title, abstract, and keyword fields. The data extraction results show 1,149 related documents.

Through evaluation and synthesis of recent scientific publications, it can be seen that employees' innovation behavior is influenced by various diverse factors, including factors related to the employees themselves, leadership, work environment, and social interactions.

2.3.3. Studies on Innovative Behavior in the Context of Digital Transformation

In the Scopus database, documents related to the keyword "innovation behavior" combined with "digital" are very limited, with only 65 documents. This shows that although innovation behavior in general has been studied relatively extensively, innovation behavior in the context of digital transformation remains a relatively new research direction that has not been fully explored.

Through reviewing 18 studies on innovation behavior in the context of digital transformation, the author has synthesized 26 factors affecting employees' innovation behavior, divided into 4 groups: Leadership in the

digital context, digital environment and organization, digital competence and knowledge, and individual psychology and motivation.

2.3.4. Studies on Digital Capability

The results show 296 scientific articles on digital capability in the Scopus database. The author has synthesized the results of 18 recent studies, showing two main aspects addressed:

(1) Factors affecting digital competence

Zhao et al. (2025) indicate that digital growth mindset, the belief that digital technology can improve capabilities, is one of the key individual characteristics that motivates employees to actively learn and improve digital skills. Similarly, Zahoor et al. (2024) also emphasize the importance of digital readiness, finding a positive relationship between it and employees' resilience and proactiveness in digital environments. In addition, factors belonging to the work environment such as corporate digital culture (Zhang et al., 2025), leadership support (Mollah et al., 2025), are also proven to have significant impacts. Furthermore, opportunities for training and professional development in digital skills play an important role, as in the study by Molla et al. (2025) on digital competence development for the workforce.

(2) Multidimensional impact of digital competence on employee and organizational performance

Many studies note the positive role of digital competence on individual work outcomes, such as improving work performance (Mansoor et al., 2025; Zhang et al., 2025), or promoting creativity and innovation (Ye and Chen, 2024). Authors also point out the close relationship between digital competence and work engagement (Ye and Chen, 2024), work motivation, and employees' positive mental state (Roodt et al., 2025). At the organizational level, digital competence is seen as an important factor contributing to increased competitive advantage (Abaddi, 2025), while promoting sustainable development (Thuy et al., 2025). However, some studies also warn about negative impacts, suggesting that rapid and

inappropriate digital transformation can cause pressure, leading to employee burnout (Xie and Yang, 2025; Zhan and Xie, 2025).

2.3.5. Research Gaps

Through reviewing research results, the author identifies 3 research gaps: (1) Gap in digital transformational leadership and digital innovative behavior. (2) Gap in the process of promoting digital innovative behavior. (3) Gap in the moderating role of generation.

2.4. HYPOTHESES, MODEL, AND RESEARCH SCALES

2.4.1. Research Hypotheses

H1: Digital transformation leadership positively affects knowledge sharing environment.

H2: Digital transformation leadership positively affects organizational agility.

H3: Digital transformation leadership positively impacts digital competence.

H4: Digital transformation leadership positively impacts attitude toward digital transformation.

H5: Knowledge sharing environment mediates the relationship between digital transformation leadership and digital competence.

H6: Organizational agility mediates the relationship between digital transformational leadership and digital competence.

H7: Digital competence positively affects attitude toward digital transformation.

H8: Digital competence positively affects digital innovative behavior.

H9: Attitude toward digital transformation positively affects digital innovative behavior.

H10: Generation moderates the relationship between digital competence and digital innovation behavior, where the impact of digital competence on digital innovation behavior is stronger in Generation Y than in Generation X.

H11: Generation moderates the relationship between attitude toward digital transformation and digital innovation behavior, where the impact of attitude toward digital transformation on digital innovation behavior is stronger in Generation X than in Generation Y.

2.4.2. Research Model and Measurement

Based on the proposed research hypotheses, the research model is constructed as shown in Figure 2.11. This model represents the relationship between digital transformation leadership, knowledge-sharing environment, organizational agility, digital competence, attitude toward digital transformation, and digital innovation behavior; while considering the role of generation.

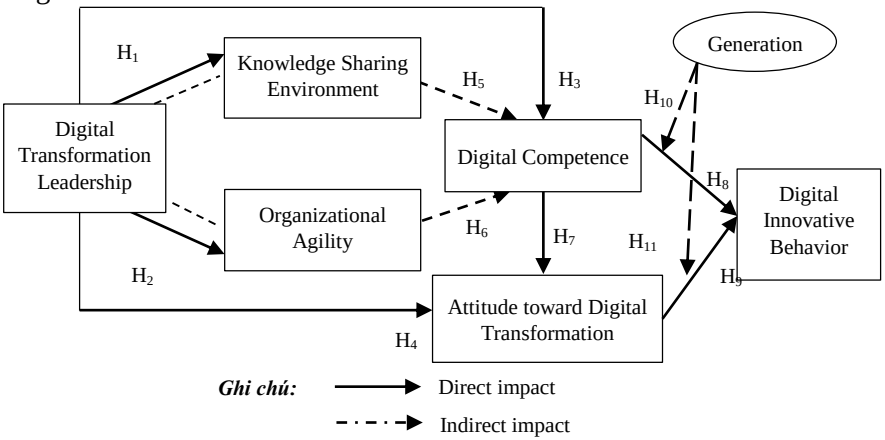

Figure 2.11. Research Model

The research scales were adapted from previous studies. Specifically: The scales for digital transformation leadership (6 indicators), organizational agility (6 indicators), and digital innovation behavior (6 indicators) were adapted from Ly (2024); The scale for knowledge-sharing environment (4 indicators) was adapted from Chen and Lin (2013); The scales for digital competence (3 indicators) and attitude toward digital transformation (3 indicators) were adapted from Meske and Junglas (2021).

CHAPTER 3: RESEARCH DESIGN

3.1. RESEARCH PROCESS

Step 1: From the identified research problem, the author reviewed related works to build the theoretical foundation. However, existing scales did not fully reflect the specifics of the transportation and logistics field, so the research conducted expert interviews and group discussions.

Step 2: The author conducted a preliminary quantitative study on a sample of 268 transportation and logistics employees using convenience sampling. The goal was to test the scales before conducting the main survey.

Step 3: In the main quantitative research phase, the author directly surveyed 620 transportation and logistics employees using purposive sampling. The research applied PLS-SEM method for data analysis. Additionally, multi-group analysis (MGA) technique was performed to evaluate the moderating role of generation.

3.2. IN-DEPTH EXPERT INTERVIEWS

The interviewed experts included: (1) researchers in the transportation and logistics field; (2) middle and senior managers of transportation and logistics companies, responsible for the company's digital transformation activities. Experts needed to have at least 5 years of work or research experience in the transportation and logistics industry. Interview results with 15 experts about the relationships between concepts in the research model showed high consensus among experts. Experts also suggested adjustments and additions to measurement indicators.

3.3. GROUP DISCUSSIONS

The author conducted group discussions with employees from 6 companies, each group consisting of 5 employees. Results showed that participating employees highly agreed with the indicators that had been modified from the previous expert interview process. Notably, during these exchanges, participants suggested modifying or removing some specific measurement indicators.

3.4. PRELIMINARY QUANTITATIVE RESEARCH

The selection of survey participants was conducted using convenience method in major cities of Vietnam, including: Hanoi, Hai Phong, Da Nang, Binh Duong, Dong Nai, and Ho Chi Minh City.

Collected questionnaires were screened to remove those that did not meet requirements. The screened data was analyzed to evaluate the scales. Two main analysis methods were Cronbach's Alpha analysis and exploratory factor analysis (EFA).

Analysis results showed that DTL2 did not ensure reliability for measuring digital transformational leadership. The remaining indicators ensured reliability and validity to continue with subsequent research steps.

3.5. MAIN QUANTITATIVE RESEARCH

3.5.1. Research Sample

The study uses purposive sampling method to select survey participants who meet requirements for work duration (1 year), job position (including office staff and field staff), age and generation (diverse, including Generation X, Y, Z).

3.5.2. Data Analysis Method

The data analysis process to test the research model includes two stages: testing the measurement model and testing the structural model. Additionally, the author applied the three-step MICOM procedure to analyze the invariance of composite models before conducting MGA multi-group analysis (Henseler et al., 2016).

CHAPTER 4: RESEARCH RESULTS

4.1. OVERVIEW OF THE TRANSPORTATION AND LOGISTICS SECTOR IN VIETNAM

4.1.1. Transportation and Logistics Enterprises

According to the Ministry of Industry and Trade (2024), the first nine months of 2024 showed contrasting trends in Vietnam's transportation and logistics sector. While 6,500 new enterprises entered the market (5.33% of all new businesses nationwide), approximately 86,900 companies suspended operations (up 14.7% from the previous year), with 13,000 enterprises permanently closing.

4.1.2. Human resources in transportation and logistics

The industry's total workforce is estimated at approximately 1.2 million workers, expected to increase to 2.5 million by 2030. However, the concerning reality is that the proportion of workers systematically equipped with professional knowledge accounts for only about 5-7% of the total, creating a large gap between supply and demand for high-quality human resources.

4.1.3. Digital transformation in the transportation and logistics sector

Vietnam's transportation and logistics sector has shown significant digital transformation readiness growth, with the overall index rising from 2.6 to 3.5 points recently (Enterprise Development Agency, 2024). This progress reflects various socio-economic factors, including growing domestic cargo volumes and deep economic integration requiring technological upgrades. The rapid e-commerce development has particularly created urgent digital transformation pressure across the industry.

4.2. INFORMATION ABOUT THE RESEARCH SAMPLE

4.2.1. Research sample characteristics

The study distributed 1,000 questionnaires, receiving 837 responses (83.7% response rate), with 620 valid for analysis (74.1%). The sample comprised 59.5% males and 40.5% females. Age distribution showed 57.4% aged 26-43 years, 35.6% aged 44-60 years, and 6.9% aged 18-25 years. Most

employees earned 7-12 million VND/month (43.7%) or 12-18 million VND/month (37.6%), with 13.5% earning over 18 million and 5.2% under 7 million. Educational qualifications included university degrees (74.7%), vocational/college degrees (16.3%), and postgraduate degrees (9%).

4.2.2. Assessment of common method bias

To detect and assess the impact of CMB, the dissertation applied Harman's one-factor test. The analysis results showed that the single common factor explained only 44.151% of the total variance - below the 50% threshold. This proves that the research data was not seriously affected by common method bias, thereby strengthening the reliability for subsequent analyses.

4.3. MEASUREMENT MODEL EVALUATION RESULTS

4.3.1. Reliability and Convergent Validity Evaluation

Cronbach's Alpha coefficients of concepts are high, ranging from 0.839 to 0.895, exceeding the minimum acceptable threshold of 0.7. Outer loading coefficients range from 0.750 to 0.881, all exceeding the standard threshold of 0.7, showing the suitability of indicators in measuring research concepts. Composite reliability (CR) of scales ranges from 0.886 to 0.923, all greater than the standard threshold of 0.7, proving good internal consistency. Additionally, average variance extracted (AVE) are all greater than 0.5 (ranging from 0.609 to 0.705), confirming that concepts have good convergent validity. Thus, the measurement model meets criteria for reliability and convergent validity, ensuring suitability for further analysis steps.

4.3.2. Discriminant Validity Evaluation

HTMT (Heterotrait-Monotrait Ratio) values between concept pairs are all less than the recommended threshold of 0.85, ranging from 0.567 to 0.847, proving that concepts have clear discriminant validity. Additionally, results according to Fornell-Larcker criteria show that the square root of AVE of each concept (diagonal, ranging from 0.780 to 0.840) is always greater than the correlation coefficients between them (off-diagonal values ranging from 0.504 to 0.728), thereby further confirming discriminant validity between research

concepts. Thus, the measurement model has ensured discriminant validity, suitable for conducting subsequent analysis steps.

4.4. STRUCTURAL MODEL EVALUATION RESULTS

4.4.1. VIF Coefficient Evaluation

VIF values range from 1.000 to 2.052, ensuring no serious multicollinearity occurs between independent variables in the research model.

4.4.2. Assessment of endogeneity

The dissertation assessed endogeneity using the Gaussian Copula method proposed by Hult et al. (2018). Results showed that all constructs did not follow normal distribution ($p < 0.05$), confirming the prerequisite condition for applying the Gaussian Copula method in controlling endogeneity. The Gaussian Copula analysis results showed that most relationship pairs had p-values > 0.05. Only the relationship between digital transformation leadership and attitude toward digital transformation had $p = 0.013$; however, this still exceeded the significance threshold of $\alpha = 0.01$. The statistically non-significant p-values demonstrate that there is no systematic correlation between predictor variables and structural errors. Therefore, it can be concluded that the research model is not affected by endogeneity issues, ensuring the robustness of parameter estimates and strengthening the reliability of causal inferences from the analysis results.

4.4.3. Coefficient of Determination (R2) Evaluation

The coefficient of determination (R-square) of latent variables are all at good levels, ranging from 0.347 to 0.701. This suggests that the antecedents of the theoretical model have explained most of the variation in the corresponding dependent variables. Specifically, digital transformational leadership explains 34.7% of the variation in knowledge sharing environment and 41.3% of the variation in organizational agility; digital transformational leadership, knowledge sharing environment, and organizational agilityexplain 70.1% of the variation in digital competence; digital transformational leadership and digital competence explain 52.9% of

the variation in attitude toward digital transformation; digital competence and attitude toward digital transformation explain 60.7% of the variation in digital innovative behavior.

4.4.4. Relationship Evaluation

All hypotheses are accepted with 95% confidence (p-value < 0.05). Specifically:

Digital transformational leadership directly and positively impacts knowledge sharing environment (β=0.589, p=0.000), organizational agility(β=0.643, p=0.000), digital capability (β=0.210, p=0.000), and attitude toward digital transformation (β=0.174, p=0.004). Hypotheses H1, H2, H3, and H4 are accepted.

The relationship between digital transformational leadership and digital competence is mediated by knowledge sharing environment (β=0.263, p=0.000) and organizational agility(β=0.212, p=0.000). Hypotheses H5 and H6 are accepted.

Digital competence directly and positively impacts attitude toward digital transformation (β=0.597, p=0.000). Hypothesis H7 is accepted.

Digital innovative behavior is directly and positively impacted by digital competence (β=0.396, p=0.000) and attitude toward digital transformation (β=0.445, p=0.000). Hypotheses H8 and H9 are accepted.

4.4.5. f2 Coefficient Evaluation

Results show that digital transformational leadership has a large impact on knowledge sharing environment (f2 = 0.532) and organizational agility(f2 = 0.704); but only a small impact on digital competence (f2 = 0.072) and employees' attitude toward digital transformation (f2 = 0.034). Digital competence has a large impact on employees' attitude toward digital transformation (f2 = 0.401). Digital competence and employees' attitude toward digital transformation have medium impacts on digital innovative behavior, with f2 of 0.194 and 0.246 respectively.

4.4.6. Q2 Coefficient Evaluation

All concepts achieve positive Q2 values, ranging from 0.243 (KSE) to 0.422 (digital competence). This confirms that the model has fairly good predictive ability for research concepts, especially for the digital competence.

4.5. ANALYSIS OF GENERATION'S MODERATING EFFECT

4.5.1. Measurement Invariance Evaluation

MICOM analysis results show that the measurement variables digital competence, attitude toward digital transformation, and digital innovative behavior achieve full measurement invariance conditions. This means that measurement structures between research groups are equivalent in structure, mean values, and variance. This result shows that the model and data ensure validity for conducting MGA analysis.

4.5.2. Multi-Group Structure Analysis (MGA)

For the relationship between digital competence and digital innovative behavior, the path coefficient difference between Generation Y and Generation X is 0.234, with p-value (2-tailed) of 0.005 (< 0.05). This shows that the impact of digital competence on digital innovative behavior in Generation Y ($\beta = 0.503$) is stronger than in Generation X ($\beta = 0.269$), and this difference is statistically significant. This result suggests that Generation Y employees, with higher digital competence, tend to exhibit stronger digital innovative behavior compared to Generation X employees.

For the relationship between attitude toward digital transformation and digital innovative behavior, the path coefficient difference between Generation Y and Generation X is -0.204, with p-value (2-tailed) of 0.001 (< 0.05). This result shows that the impact of attitude toward digital transformation on digital innovative behavior in Generation X ($\beta = 0.555$) is stronger than in Generation Y ($\beta = 0.351$).

4.6. ANALYSIS OF CONTROL VARIABLES' IMPACT

4.6.1. Impact of Control Variables on Digital Capability

Gender and age do not impact digital competence of employees in Vietnam's transportation and logistics industry. Conversely, income and professional qualifications create significant differences in employees' digital competence.

4.6.2. Impact of Control Variables on Attitude Toward Digital Transformation

All control variables including gender, age, income, and professional qualifications do not impact attitude toward digital transformation of employees in Vietnam's transportation and logistics industry.

4.6.3. Impact of Control Variables on Digital Innovative Behavior

All control variables including gender, age, income, and professional qualifications do not impact digital innovative behavior of employees in Vietnam's transportation and logistics industry.

4.7. DISCUSSION OF RESEARCH RESULTS

First, research shows that digital transformational leadership positively impacts knowledge sharing environment ($\beta = 0.589$, $p = 0.000$) and organizational agility($\beta = 0.643$, $p = 0.000$), supporting hypotheses H1 and H2. This aligns with previous findings about leaders' role in orientation and culture creation (Arham et al., 2024). Knowledge sharing environment and organizational agilityalso play mediating roles in the relationship between digital transformational leadership and digital competence, with path coefficients of 0.263 and 0.212 respectively ($p = 0.000$), supporting hypotheses H5 and H6. This result adds a new perspective to previous research on impact of digital transformational leadership, which mainly focused on direct influence on flexibility or digital transformation results (AlNuaimi et al., 2022; Ly, 2024). This finding also aligns with evidence about the positive impact of knowledge sharing culture and organizational agilityon capabilities in general and digital competence in particular of

employees (Ravichandran, 2018; Meher et al., 2022; Chen et al., 2023; Gong and Ribiere, 2023).

Second, research has shown a positive and statistically significant relationship between digital transformational leadership and digital competence ($\beta = 0.210$, $p=0.000$), attitude toward digital transformation ($\beta = 0.174$, $p=0.000$), supporting hypotheses H3 and H4. This result aligns with Grant's (1996) knowledge-based theory and Bandura's (1977) social learning theory. Although previous studies have not directly tested the relationship between digital transformational leadership with digital competence and attitude toward digital transformation, this research's results still show alignment with some recent studies on leadership's role in the context of digital transformation (Mollah et al., 2025; Park and Kim, 2018; Roodt et al., 2025; Yuan and Khan, 2024).

Third, research results show that digital competence positively impacts attitude toward digital transformation ($\beta = 0.597$, $p = 0.000$) and digital innovative behavior ($\beta = 0.396$, $p = 0.000$), supporting hypotheses H7 and H8. Additionally, results also support TPB by showing the positive impact of attitude toward digital transformation on digital innovative behavior ($\beta = 0.445$, $p = 0.000$), accepting hypothesis H9. This result aligns with the theory of planned behavior (TPB) by Ajzen (1985), which emphasizes the role of perceived behavioral control and individuals' attitude toward behavior.

Fourth, research explores the moderating role of generation on the relationship between digital competence and digital innovative behavior ($\beta = 0.234$, $p = 0.000$), attitude toward digital transformation and digital innovative behavior ($\beta = -0.204$, $p = 0.000$). This means that the impact of digital competence on digital innovative behavior in Generation Y is stronger than in Generation X, while the impact of attitude is stronger in Generation X.

CHAPTER 5: CONCLUSION AND MANAGEMENT IMPLICATIONS

5.1. RESEARCH CONCLUSIONS

5.1.1. Results answering the research questions

The bibliometric analysis and content review results of 73 scientific articles on digital transformation leadership, innovation behavior, and innovation behavior in the digital transformation context identified 3 research gaps. Accordingly, the proposed dissertation research model was based on foundational theories (knowledge capital theory, social learning theory, theory of planned behavior) and previous research results to help fill these research gaps.

The research results demonstrate:

Direct influence of digital transformation leadership on knowledge-sharing environment ($\beta = 0.589$, $p = 0.000$), organizational agility ($\beta = 0.643$, $p = 0.000$), digital competence ($\beta = 0.210$, $p = 0.000$), and attitude toward digital transformation ($\beta = 0.174$, $p = 0.004$).

The relationship between digital transformation leadership and digital competence is mediated by knowledge-sharing environment ($\beta = 0.263$, $p = 0.000$) and organizational agility ($\beta = 0.212$, $p = 0.000$).

Digital competence directly and positively affects attitude toward digital transformation ($\beta = 0.597$, $p = 0.000$). Digital innovation behavior is directly and positively influenced by digital competence ($\beta = 0.396$, $p = 0.000$) and attitude toward digital transformation ($\beta = 0.445$, $p = 0.000$).

Significant differences between Generation Y and Z groups in the relationship between digital competence and digital innovation behavior ($p = 0.05$), as well as between attitude toward digital transformation and digital innovation behavior ($p = 0.001$).

Managerial implications focus on organizational architecture, enhancing digital competence, and managing employees' attitude toward digital transformation.

5.1.2. Results of research scale development

The measurement scales were developed from previous studies and refined through expert and employee consultations in the transportation and logistics sector. A pilot study (n=268) confirmed reliability, convergent validity, and discriminant validity, with Cronbach's Alpha ranging from 0.819 to 0.886, factor loadings from 0.528 to 0.861, KMO = 0.785, and total variance extracted = 61.195%. The final scales comprised 6 constructs with 33 observed variables, validated as appropriate for Vietnam's transportation and logistics context.

5.2. RESEARCH CONTRIBUTIONS

5.2.1. Theoretical Contributions

This research has contributed new theoretical knowledge, helping to clarify the relationship between digital transformational leadership, knowledge sharing environment, organizational agility, digital competence, attitude toward digital transformation, and digital innovative behavior of employees in the transportation and logistics industry.

5.2.2. Practical Contributions

The research brings practical contributions, especially in the context of Vietnam's transportation and logistics industry facing opportunities and challenges from the digital transformation wave.

5.3. MANAGEMENT IMPLICATIONS

5.3.1. Implications for organizational architecture

Establish mechanisms to encourage knowledge sharing

Develop organizational agility mechanisms

Develop digital transformation leadership capabilities

5.3.2. Developing employees' digital competence

Build a digital competence framework for transportation and logistics employees

Implement digital competence training programs tailored to generational characteristics

Establish a continuous digital competence assessment and development system

5.3.3. Managing employees' attitude toward digital transformation

Deploy internal communication campaigns about digital transformation

Apply behavioral nudging techniques to encourage digital technology use

Build a culture of innovation and experimentation in the organization

5.4. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Although the research has contributed knowledge about the relationships between digital transformational leadership, knowledge sharing environment, organizational agility, digital competence, attitude toward digital transformation, and digital innovative behavior, there are still some limitations:

The research used purposive sampling, which is a non-probability method, potentially affecting the sample's representativeness and the generalizability of results. Future research should apply probability sampling methods and expand the sample size to enhance representativeness.

The study has not deeply analyzed the differences between service types in the transportation and logistics sector. This may limit the ability to identify specific characteristics of each service segment in the digital transformation process. Future research should consider comparative analysis between different service groups to provide specific and appropriate recommendations.

The cross-sectional research design at one point in time makes it difficult to conclude causal relationships between concepts. Therefore, future studies should consider using longitudinal data or experimental designs to more accurately test causal relationships.

The research model only considers certain mediating and moderating factors. Future studies could consider variables such as organizational culture, job characteristics, or demographic characteristics and other contextual factors such as industry characteristics, enterprise size, or technology readiness level.

PUBLICATIONS RELATED TO THE DISSERTATION

[1] Nguyen Van Tinh & Tran Nguyen Khanh Hai (2025). The impact of digital transformation leadership on the digital innovation behavior of employees in the transportation and logistics industry in Vietnam. *Journal of Finance & Accounting Research, 289*, 17-20. https://doi.org/10.71374/jfarv.v25.i289.04

[2] Nguyen Van Tinh & Tran Nguyen Khanh Hai (2025). The role of leadership in digital transformation - Trends in the era of digital technology. *Review of Finance, 850*, 84-88.

[3] Nguyen Van Tinh & Tran Nguyen Khanh Hai (2025). An overview of research on employees' digital innovation behavior. *Review of Finance,* 851, 230-233.

[4] Nguyen Van Tinh & Tran Nguyen Khanh Hai (2025). The role of digital transformation leadership in the digital capability of employees in Vietnam's transportation and logistics industry. *Journal of State Management.* Retrieved from: https://www.quanlynhanuoc.vn/2025/06/03/vai-tro-cua-lanh-dao-chuyen-doi-so-doi-voi-nang-luc-so-cua-nhan-vien-nganh-van-tai-va-logistics-tai-viet-nam/