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Impacting Digital Transformation of Human Resource Management on Enterprise Competitive Capacity: A Case Study in Vietnam

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ABSTRACT: In the era of rapidly developing digital technology, digital transformation has become an inevitable trend globally, and Vietnam is also following that trend. The digital transformation of human resource management is necessary for optimizing human resources, improving labor productivity, and enhancing competitiveness. This study analyzes the key factors affecting the competitive capacity of small and medium enterprises (SMEs) in Vietnam and provides recommendations to improve this process. The research utilizes a mixed-methods approach, combining qualitative interviews with 30 business managers and a quantitative survey of 650 managers across five provinces and one city. Using structural equation modeling (SEM), the study identifies five critical factors influencing competitive capacity: human resource management, corporate culture, online public relations, digital transformation, and creative innovation. Among these, digital transformation has the strongest impact on enterprise competitiveness ($\beta = 0.341$, $p < 0.001$), followed by corporate culture ($\beta = 0.203$, $p < 0.001$) and creative innovation ($\beta = 0.165$, $p < 0.001$). The findings highlight the necessity of integrating digital tools into human resource management (HRM), fostering a supportive corporate culture, and leveraging innovation to enhance business performance. These insights offer significant contributions to both academic research and practical management strategies. The study proposes key policy recommendations, including targeted digital upskilling, investment in technological infrastructure, and corporate culture reforms to facilitate digital transformation in Vietnamese SMEs.

Keywords: Human resource management, digital transformation, and enterprise competitive capacity.

I. INTRODUCTION

Small and medium-sized enterprises (SMEs) in Vietnam are the majority of enterprises and play an essential role in creating jobs and increasing income for workers, helping to mobilize social resources for investment, development, poverty reduction, etc. Every year, these enterprises generate more than 500.000 jobs, employ up to 50% of the social workforce, and contribute more than 40% of the country's GDP.

Vietnamese SMEs are the majority of enterprises and play an essential role in creating jobs and increasing worker income. Owners of small and medium-sized enterprises are usually engineers or technicians who establish and operate their own businesses. They are both managers and directly involved in production, so their expertise in business management is not high. In addition, most owners of small and medium-sized enterprises do not participate in formal management training courses and do not have enough knowledge about business administration; they only manage based on experience and subjective opinions. Moreover, digital technology requires organizations to participate in digital transformation to ensure competitiveness. The success of the digital transformation process depends entirely on whether the participants perform their functions properly [1, 2]. Human resources are closely

related to digitizing the workforce, the workplace, and human resources, and any disruption in the digitalization process directly affects business operations.

Digital transformation is an indispensable part of Vietnam's development strategy, primarily because the Government has implemented many policies to promote digitalization in enterprises. The Vietnamese Government has issued the National Digital Transformation Program 2025 and vision for 2030, aiming to achieve 90% of public organizations and enterprises to successfully transform digitally (Ministry of Information and Communications, 2024). Vietnam's digital transformation policy platform focuses on enterprises and promotes digital skills training for the workforce. The training programs on digital technologies such as artificial intelligence, cloud computing, and blockchain are being expanded at universities to build a digitally skilled workforce to meet market needs.

Applying digitalization in human resource management can help organizations significantly improve productivity and work efficiency. Other studies emphasize that artificial intelligence supports human resources in the recruitment, training, and performance management processes, assisting businesses to make more specific and accurate data-based decisions [3, 4]. Other studies show that companies that successfully apply digital transformation can improve labor productivity by up to 30% while creating a more flexible working environment suitable for remote working trends. Despite the many benefits of digital transformation, Vietnamese businesses still face significant challenges. First, the initial investment cost for digital human resource management systems is relatively high, which makes it difficult for small and medium-sized enterprises (SMEs) to deploy advanced technology (Vietnam Digital Readiness Report, 2024). Next, Vietnam is facing a severe shortage of digitally skilled workers, leading to the need for digital skills training programs to improve the workforce's adaptability to new technologies. In addition, data security is also an essential issue in the digital transformation of human resource management. With the increase in the collection and storage of digital human resource data, businesses face security and privacy risks, especially when there are not enough strict protection measures.

Currently, very few small and medium-sized enterprises make long-term human resource plans. According to statistics, up to 85% of all enterprises forecast demand based on the number of employees that need to be replaced, and only about 15% based on changes in science, technology, product and service needs, capital scale, etc. In addition, the surplus or shortage of labor is only determined by each department based on the current workload without the participation of the human resources department. The human resources department only has the function of receiving labor quotas and performing recruitment [5, 6]. Many Vietnamese SME owners also identify short-term human resource needs or make decisions based on the current situation. Only businesses with 50-300 employees are still interested in and have a human resource strategy, but these strategies are still very sketchy. Regarding evaluating the implementation of human resource plans and making predictions for the following year's plan, Vietnamese managers in general and SMEs in particular still do not attach importance to this process, so this work in enterprises is still straightforward. However, reality shows that human resources for digital transformation in Vietnam are lacking and weak, specifically:

Firstly, Vietnam seriously lacks human resources, knowledge, skills, and mastery of new technologies, technologies typical of digital transformation, such as artificial intelligence, data science, automation, or blockchain. The number of students graduating from majors directly related to digital transformation is about 65.000 persons yearly. However, this number is still low, leading to the direct consequence that Vietnam is facing the risk of a shortage of highly skilled human resources to carry out digital transformation despite the increasing recruitment needs of agencies, organizations, and businesses to carry out this transformation process. Not only that, in the structure of human resources, the ratio of technical human resources/total labor force of the Vietnamese economy has only reached more than 1%.

Second, Vietnam's digital workforce lacks the necessary skills to fully master digital transformation programs. Only 40% of businesses said they have enough information technology and communications skills to maintain and fully exploit their digital technology systems. Notably, other studies also pointed out a worrying reality: of the more than 60.000 information technology personnel graduating each year at intermediate, college, and university levels, only about 1/3 of them can work immediately. The majority must be further trained by businesses to be able to officially start working. Furthermore, Vietnam does not have national digital skills standards, such as data analysis, artificial intelligence, etc., but currently only has standards for information technology skills.

Despite the increasing academic focus on digital transformation (DT) and HRM, existing research has concentrated mainly on large enterprises with well-established digital infrastructures, leaving a knowledge gap regarding SMEs, which face unique challenges in implementing digital HRM practices. While previous studies have explored the general benefits of digital transformation in business processes, there is limited empirical research on how digital transformation in HRM directly influences enterprise competitive capacity (ECC), particularly in the context of SMEs in Vietnam. Additionally, most studies treat corporate culture, public relations, and innovation as separate constructs, failing to examine their interconnected roles in facilitating digital transformation and enhancing competitiveness. The lack of an integrated framework that connects HRM, corporate culture, digitalization, and innovation to competitive advantage leaves a significant research gap.

Furthermore, while prior research has emphasized the technological aspects of digital transformation, little attention has been given to human-centric challenges, such as employee resistance, leadership mindset, and corporate culture adaptability, which can either accelerate or hinder digital adoption. SMEs in Vietnam, in particular, struggle with limited digital literacy, financial constraints, and a lack of structured HRM strategies, yet there is insufficient empirical data on how these factors impact their digital transformation journey and competitive capacity. Thus, this study addresses these gaps by developing a comprehensive research model that examines the key factors (HRM, corporate culture, public relations, digital transformation, and creative innovation) affecting enterprise competitive capacity in Vietnamese SMEs. Using structural equation modeling (SEM) on a dataset of 650 SME managers, this research provides empirical insights into how digital HRM transformation drives enterprise competitive capacity and what organizational factors influence its success.

The study integrates Dynamic Capabilities Theory and Innovation Theory to examine how SMEs develop technological agility, embed innovation into HRM, and sustain competitive capacity [3, 36, 37]. By linking digital transformation, corporate culture, and innovation with organizational adaptability, the research builds a holistic model that explains how firms leverage digital tools, enhance workforce competencies, and foster corporate agility in an evolving market landscape. For Vietnam to catch up with the digital transformation in the world, increase competitiveness, and keep up with the development of global technology, it is necessary to identify some tasks and solutions for human resource development. Therefore, the study goal is to find out key factors affecting enterprise competitive capacity, and based on the results, the authors had policy recommendations for highlighting its significance and contributions to both scientific inquiry and practical governance policies under the conditions of international integration with the goal of enterprise competitive capacity in Vietnam. Based on the study goal, the authors asked the following research question: What are the key determinants affecting the enterprise competitive capacity in Vietnam, and how do these determinants facilitate enterprise competitive capacity? What policy recommendations should be considered?.

II. LITERATURE REVIEW

1. ENTERPRISE COMPETITIVE CAPACITY (ECC)

The competitiveness of a business is also defined as the ability to meet and compete with competitors in providing products and services most sustainably [7]. Besides, the competitiveness of an enterprise must first be created from the enterprise's capabilities and strengths. An enterprise is considered to have competitive capacity when it dares to accept favorable conditions that benefit it. An enterprise must have strong enough potential to stand firm in competition [8, 9]. The competitiveness of enterprises is based on many factors, such as high product quality and usage value and stable production conditions because production is mainly based on modern techniques, advanced technology, and large production scale, thus lowering product costs and prices. Social factors such as maintaining credibility in the market, propaganda, consumer guidance, and advertising also significantly influence. Currently, manufacturers also use some forms, such as installment sales, to stimulate consumption, thereby increasing competitiveness.

However, to evaluate the competitiveness of a business, it is not only necessary to assess the factors of the business itself, but it is also essential to evaluate and compare with competitors operating in the same field and the same market. The business must establish a comparative advantage over its partners based on these comparisons to create competitiveness. Thanks to this advantage, the business can better satisfy its target customers' demands and attract

competitors' customers [10]. The competitiveness of enterprises is also affected by the business environment and its unpredictable fluctuations. Changing the business environment can be an opportunity for development for one enterprise and a risk of bankruptcy for another.

2. CREATIVE INNOVATION (CI)

Creativity covers various dimensions, including adaptive thinking, problem identification, idea synthesis, and the capacity to translate innovation into practice. Enhancing creative thinking in individuals improves work performance, facilitates more effective problem-solving, and contributes to the organization's overall development [11, 36, 37]. Creativity fosters a dynamic workplace for firms, enabling employees to explore innovative ideas without fearing failure. In the digital era, enterprises can leverage artificial intelligence, big data, and the Internet of Things to foster innovation [12].

Moreover, creativity is not solely an inherent trait; it can also be cultivated and enhanced through education, experiential learning, and an environment that fosters invention. Successful enterprises frequently foster creativity by establishing a flexible management framework, facilitating employee involvement in the decision-making process, and inviting the proposal of ideas. Investing in innovation enhances operational efficiency, fosters strategic breakthroughs, expands market share, and attracts talent. Consequently, creativity is not merely a benefit but an essential necessity for progress [14, 15].

3. DIGITAL TRANSFORMATION (DT)

A company or organization undergoes digital transformation when digital technologies are integrated into every part to boost productivity, optimize operations, and generate new value. A paradigm change is required in how businesses function, provide their services, and engage with consumers; this change is more extensive than just digitizing data or automating processes [16, 36-38]. By embracing digital transformation, organizations may better respond to shifting consumer preferences, enhance decision-making using data analytics, and maintain a competitive edge in today's digital landscape [17, 18, 41]. As part of this shift, we are embracing new technology like Blockchain, the Internet of Things (IoT), Cloud Computing, Artificial Intelligence (AI), and Big Data to boost efficiency and innovation. In addition, it changes the way businesses approach the market, interact with customers, and create value. Both operational performance and customer experience are enhanced by a digitally changed enterprise's ability to provide more efficient and tailored services.

Organizational and cultural changes are also necessary for digital transformation, with companies encouraging agility, creativity, and a data-driven approach. Investing in digital talent development, redesigning procedures, and embracing continuous learning are crucial for companies to sustain success in the ever-changing digital economy. With the help of digital transformation, firms may become more resilient, stay ahead of the competition, and ensure their long-term viability in a constantly changing world [19].

4. HUMAN RESOURCE MANAGEMENT (HR)

Human resource management is the process of recruiting, training, developing, and maintaining personnel to achieve organizational goals. This strategic approach helps improve performance and create a competitive advantage [20]. Key activities include human resource planning, recruitment, training, performance appraisal, and compensation. Businesses need to determine human resource needs for effective recruitment. Training helps improve skills and labor productivity. Evaluate performance to optimize employee capabilities. Reasonable salary and bonus policies help motivate work. Labor relations management helps maintain a positive work environment. HRM optimizes human resources and builds a sustainable corporate culture. This core factor allows businesses to develop long-term [21].

5. CORPORATE CULTURE (CC)

Corporate culture is the set of values, beliefs, and rules that govern behavior within an organization. Corporate culture has three levels: core values, shared beliefs, and external manifestations. It directly affects employee morale and performance [22, 23, 36, 37]. A positive culture helps increase engagement and creativity in the business. Key elements include vision, mission, and core values. Leadership style and work environment also impact

organizational culture. Appropriate human resource policies help build a sustainable culture [24]. A strong company culture helps businesses grow and attract talent. This is an essential factor that creates a competitive advantage. An organization with a solid culture will have a foundation for long-term development.

6. ONLINE PUBLIC RELATIONS (PR)

Online public relations (PR) use the internet to manage images and build corporate reputation. PR includes social media, reputation management, and electronic press relations. It helps organizations reach the public quickly and respond promptly [25]. Popular channels include websites, blogs, social networks, and email marketing. An effective PR strategy helps enhance brand reputation. Businesses can use ePR to handle communication crises. It creates opportunities to connect with potential customers and partners. ePR also helps increase engagement and build trust. PR is essential in maintaining a professional image in the digital age. A successful business needs a suitable PR strategy [26, 27].

III. THEORETICAL FRAMEWORK

1. HUMAN RESOURCE MANAGEMENT (HR)

In the 4.0 Industrial Revolution context, digital transformation has become essential to help businesses improve their competitiveness. Human Resource Management (HRM) is indispensable in supporting and promoting digital transformation while creating a sustainable competitive advantage [28]. This article will analyze the relationship between human resource management, digital transformation, and enterprise competitive capacity. Human resource management significantly impacts digital transformation through the following aspects: Enhance digital transformation readiness: A flexible human resources system with good digital skills will help businesses deploy new technology effectively. Minimize risks in digital transformation: Building a team of technology-savvy personnel allows companies to minimize risks related to digital transformation. Promote the application of new technology: When personnel have an open mind and are willing to learn, businesses can quickly deploy technologies such as AI, Big Data, and Cloud Computing into business operations. Enterprise competitive capacity depends on effective human resource management in digital transformation: Increase work efficiency: Good human resource management helps optimize labor productivity, thereby improving business efficiency [29]. Attract and retain talent: Businesses with good human resource strategies will attract and retain talent, helping maintain competitive advantage. Creating competitive advantage through technology: When employees are proficient in applying technology, businesses can improve products, services, and operating processes. Human resource management plays a key role in the digital transformation and enhancing the enterprise's competitive capacity. Thus, the authors proposed hypotheses H1 and H2 in Figure 1 as follows:

- H1: Human resource management positively influences the enterprise's competitive capacity.
- H2: Human resource management positively influences digital transformation.

2. CORPORATE CULTURE (CC)

In substantial digital transformation, corporate culture is key in shaping business success. A suitable culture supports the digital transformation process and helps improve competitiveness. An appropriate corporate culture will determine the success of digital transformation through the following factors: Promote readiness for change: Employees and leaders with open minds will more readily adopt and implement new technology [30]. Motivate innovation: A corporate culture encouraging creativity helps employees proactively propose digital transformation ideas. Support training and development of digital skills: A culture of continuous learning helps employees update their technological knowledge and improve their ability to apply digitalization. Minimize psychological barriers: Some businesses encounter difficulties in digital transformation because employees fear losing their jobs or are unfamiliar with new technology. A positive corporate culture helps mitigate this mentality [31]. Moreover, enterprise competitive capacity depends not only on technology but also on maintaining a strong culture. Organizational culture affects competitiveness by improving work performance: A positive organizational culture helps employees work effectively, increasing labor productivity. Create sustainable competitive advantage: Businesses with a culture

of continuous innovation are often industry leaders. Increase employee engagement: Good corporate culture helps retain talent and reduces turnover. Improve customer experience: A customer-focused culture helps businesses build stronger brands and differentiate themselves from competitors. Organizational culture is an essential foundation that determines the success of digital transformation and the competitiveness of businesses. Thus, the authors proposed hypotheses H3 and H4 in Figure 1 as follows:

- H3: Corporate culture positively influences the enterprise's competitive capacity.
- H4: Corporate culture positively influences the digital transformation.

3. ONLINE PUBLIC RELATIONS (PR)

In the digital age, online public relations (PR) have become a strategic tool for helping businesses maintain their brand image, interact with customers, and create sustainable value. PR not only supports the digital transformation process but also promotes innovation and enhances the competitiveness of businesses [32]. Online public relations is important in promoting businesses' digital transformation by changing how you approach customers. Thanks to PR, businesses can accurately reach target customers through analytical data and digital media platforms. Supporting digital transformation strategies: PR helps businesses convey messages about digital transformation, create internal consensus, and raise awareness about the importance of digital technology. Promoting digitalization in corporate communications: Leveraging technology to deploy smarter, more effective communications campaigns. Moreover, PR helps businesses interact with customers and drives innovation by exploring customer information [33]. Data from customer feedback on digital platforms helps businesses improve products and services. Create an environment that encourages creativity: Listening to customers and providing timely feedback helps businesses adjust strategies and develop new products to suit market needs. Using AI and Big Data in public relations: Data analysis tools help businesses predict trends, optimize communication campaigns, and develop creative ideas based on customer behavior. Online public relations are an important factor that helps businesses promote digital transformation, stimulate innovation, and improve competitiveness. Thus, the authors proposed hypotheses H5, H6 and H7 in Figure 1 as follows:

- H5: Online public relations positively influencing digital transformation.
- H6: Online public relations positively influencing the creative innovation.
- H7: Online public relations positively influencing the enterprise's competitive capacity.

4. DIGITAL TRANSFORMATION (DT)

In the 4.0 Industrial Revolution context, digital transformation is no longer an option; it has become essential to help businesses develop sustainably. Digital transformation improves operational efficiency, promotes innovation, and enhances competitiveness. Digital transformation stimulates business innovation by improving research and development (R&D) capacity [34, 41]. Digital technology helps businesses collect and analyze market data, customer behavior, and industry trends to make more accurate creative decisions. AI and Big Data support demand prediction and optimize the new product/service development process. Accelerate product and service innovation through cloud computing and platforms to help businesses test products faster, shortening the time from idea to deployment. IoT and automation help innovate products, enhance customer experiences and develop new business models [35]. Digital transformation helps businesses increase competitiveness by improving performance and optimizing costs. Process automation helps businesses reduce labor costs and improve work efficiency. Data analytics helps businesses make decisions based on actual data instead of guesswork. Improve customer experience through AI and chatbots, which help personalize customer service, creating a seamless experience across digital channels. Customer data analytics help businesses predict demand and optimize marketing strategies. Digital transformation is an essential factor that helps businesses promote innovation and improve competitiveness. Thus, the authors proposed hypotheses H8 and H9 in Figure 1 as follows:

- H8: Digital transformation positively affects the enterprise's competitive capacity.
- H9: Digital transformation positively affects the creative innovation.

5. CREATIVE INNOVATION (CI)

In the context of globalization and the strong development of technology, innovation has become a core factor to help businesses maintain and improve competitiveness. Innovative businesses can better adapt to market fluctuations, create unique value, and maintain long-term competitive advantage [36]. Innovation enhances an enterprise's competitive capacity by optimizing products, processes, and business models. Businesses with innovative thinking will easily create differences in products/services, enhance value, and attract customers. Besides, innovation helps optimize operating processes, reduce costs, and improve working efficiency [37]. Businesses that apply digital technology, AI, and Big Data to business can improve customer experience and increase satisfaction and loyalty. Innovation also helps businesses adapt quickly to market changes. In addition, innovation also creates conditions for the development of new business models, the expansion of markets, and the increase of competitive advantage. To be effective, businesses need to invest in R&D, encourage a culture of innovation, and leverage data to make strategic decisions. A continuously innovated business will be able to lead the industry, attract talent, and grow sustainably. Businesses that do not adapt to innovation risk falling behind and losing their competitive position in the modern market. Thus, the authors proposed hypothesis H10 in Figure 1 as follows:

- H10: Creative innovation positively affects the enterprise's competitive capacity.

These studies are built upon existing research in emerging markets. The study highlights digital HRM's role in improving agility among SMEs, while other studies have shown similar findings in the manufacturing sector. These comparative insights emphasize that challenges such as digital illiteracy, lack of skilled labor, and cultural inertia are not unique to Vietnam but are shared among ASEAN nations. Therefore, the present model contributes both locally and regionally.

The research model is based on the authors' investigation of those mentioned above and their integration of the theoretical framework with pertinent research from domestic and foreign sources. The research model is based on five factors modified to fit the specific situation in Vietnam. After developing a study model, the authors constructed a proposed scale, analyzed the model and the scale, and then collected preliminary data to test the reliability and validity of the scale. The study model and hypothesis are based on these factors. The model focused on five core constructs - HRM, corporate culture, digital transformation, online public relations, and creative innovation to maintain theoretical parsimony and reduce multicollinearity in SEM analysis. While variables such as leadership style, digital maturity, and financial capacity are significant, their exclusion was deliberate to streamline the model. These variables are acknowledged as essential extensions for future research.

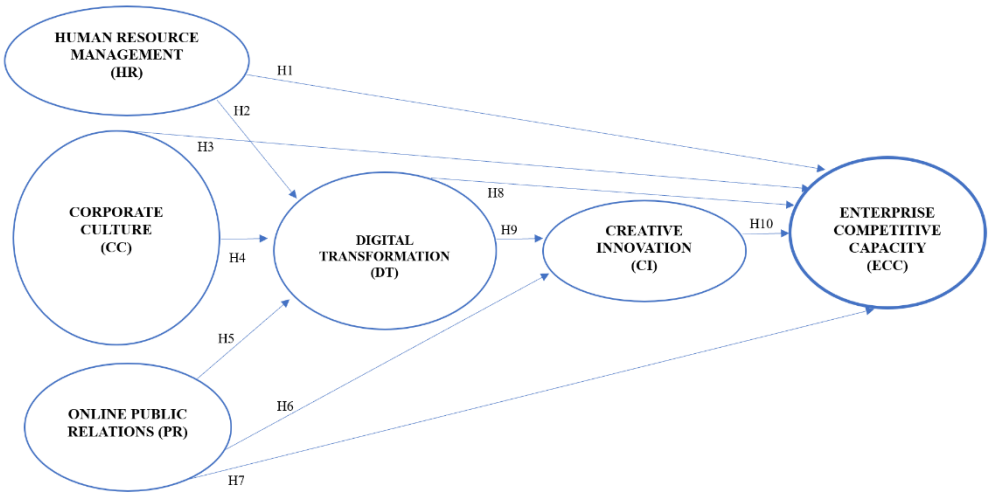

FIGURE 1. A research model for factors affecting the enterprise's competitive capacity.

Source: The authors proposed

Figure 1 depicts five critical factors of the competitive capacity of small and medium enterprises in Vietnam: (1) Human resource management (HR), (2) Corporate culture (CC), (3) Online public relations (PR), (4) Digital transformation (DT), and (5) Creative innovation (CI). Dependent variable: Enterprise competitive capacity (ECC).

This study controls for external variables to strengthen the analysis of digital transformation and SME competitiveness. Industry type was categorized into manufacturing, services, technology, retail, and finance to account for sectoral differences in digital adoption. Company size was classified by employee count (<50: small, 50–300: medium) to assess resource availability. Firm age was included to evaluate how organizational maturity affects HRM strategies. Geographic location was controlled by stratifying SMEs across five key provinces. These variables were integrated into the SEM model to minimize confounding effects. Controlling for these factors enhances the precision and validity of the findings.

IV. METHODOLOGY AND DATA

1. QUALITATIVE RESEARCH

This study involving human participants was reviewed and approved by the Ethics Committee of Lac Hong University, and the questionnaires clearly in Table A1 had ethics approval from the Faculty of Postgraduate Studies at Lac Hong University (LHU), Vietnam (https://lhu.edu.vn/244/Khoa-Sau-dai-hoc.html). All participants were informed about the purpose of the research and voluntarily agreed to participate by signing a consent form. Respondents were assured of data confidentiality and anonymity throughout the research process. All procedures followed international ethical research standards. Thus, the authors developed the research model by analyzing and synthesizing the theoretical framework and relevant publications from both domestic and foreign contexts. After constructing a primary scale, the authors gathered official data to evaluate the research model and hypothesis [13]. The authors draw conclusions and make policy recommendations for the enterprise's competitive capacity. The study used the scale development research approach, which was carried out in two phases, as follows:

Phase 1 of the inquiry included three components: (1) An analytical framework for investigating concepts like enterprise competitive capacity. Identify the variables impacting enterprise competitive capacity; (2) Determine the linkages between the concepts within the research model; and (3) Develop an initial scale for the research concepts with a measurable scale, precisely the scale of factors influencing enterprise competitive capacity. Through empirical research and interviews with a cohort of 30 managers about the company's competitive potential, the authors progressed the development of variables for quantifying notions.

Phase 2 entails (1) changing and improving the magnitude of present concepts and (2) defining a set of variables for the magnitude of new images integrated into the model. Focus group discussions were used as initial research to develop and improve the core scales. Focus group interviews were done. Multiple groups were formed and interviewed, including business directors and department heads. This phase results in modifying the original scale, the changeable scale. The authors conducted the initial quantitative research through direct interviews with individual managers using the questionnaire developed at the end of step 2. The data-gathering sample consisted of 200 company executives, who were questioned across three provinces. Cronbach's alpha reliability coefficients and exploratory component analysis were used to examine the dataset generated in step 3. Using a random sampling procedure, the redesigned scale was tested in the first quantitative study with 200 business leaders. The scales were calibrated using two principal methodologies: (1) Cronbach's Alpha reliability coefficient methodology and (2) exploratory factor analysis (EFA). Cronbach's Alpha coefficient is used to determine the reliability of 0.6.

Based on the foregoing, the authors researched and integrated the theoretical framework with relevant research from local and international sources, yielding the research model. Following the development of a study model, the authors created a proposed scale, analyzed both the model and the scale, and collected preliminary data to test the scale's reliability and validity to assess the study model and hypothesis based on 05 factors that have been adjusted to suit the actual situation in Vietnam; the research model is as above. This study integrates descriptive and analytical approaches to examine digital transformation in SMEs. The descriptive aspect highlights HRM practices, corporate culture, and innovation trends, using summary statistics to present digital adoption patterns. The analytical aspect employs Structural Equation Modeling (SEM) to test relationships between digital transformation and competitive capacity. While the cross-sectional design limits causal inference, mediation analysis helps identify indirect effects.

The study moves beyond trend analysis to explore theoretical linkages between key factors. This mixed-methods approach ensures a comprehensive understanding of SME competitiveness.

2. QUANTITATIVE RESEARCH

This study employed a structured questionnaire to assess the impact of digital transformation, HRM, corporate culture, public relations, innovation, and competitive capacity in Vietnamese SMEs. The survey questions were adapted from validated studies in HRM, digital transformation, and enterprise competitiveness, ensuring theoretical alignment. The questionnaire consisted of five sections, covering demographics, digital transformation adoption, corporate culture, innovation, and competitive capacity. Expert reviews ensured content validity, while construct validity was confirmed via Exploratory Factor Analysis (EFA). Reliability testing using Cronbach's Alpha showed values exceeding 0.7, ensuring internal consistency. A pilot test with 30 SME executives refined ambiguous questions before full deployment. A 5-point Likert scale was used for uniform responses and statistical analysis in Table A1. The survey was structured to allow SEM-based analysis, ensuring the identification of direct and indirect effects. This rigorous approach enhances the study's credibility, validity, and applicability to SME competitiveness in Vietnam.

During the quantitative portion of the study, the authors conducted formal studies in Vietnam's Dong Nai Province, Ba Ria-Vung Tau Province, Binh Duong Province, Binh Phuoc Province, Tay Ninh Province, and Ho Chi Minh City. A poll of business executives in the three provinces listed above is being undertaken. Direct interviews with a structured questionnaire collect information from 650 business leaders. The evaluation used probability and random sampling; however, only 603 samples were valued. Only 603 samples were processed after the data was encrypted, entered, and analyzed with SPSS 20.0 and AMOS. This study examines 650 business executives from Vietnamese SMEs using stratified random sampling to ensure representativeness. Participants were selected from manufacturing, services, technology, retail, and finance sectors across Ho Chi Minh City, Hanoi, Da Nang, Can Tho, and Dong Nai. 650 surveys were sent, with 603 valid responses retained, yielding a 92.76% response rate. The selection targeted CEOs, HR managers, and digital transformation officers to ensure expertise. This study employs a structured survey-based methodology to analyze the impact of digital transformation in HRM on enterprise competitive capacity in Vietnamese SMEs. Data was collected from 650 business executives across various industries and regions to ensure representativeness and validity. Data collection included 70% online surveys and 30% in-person interviews. This approach ensures regional and industry diversity, making the findings applicable to Vietnam's SME sector. The dataset was tested for scale reliability using Cronbach's Alpha. This phase involved evaluating the coefficients to assess scale dependability. Cronbach's Alpha is derived from an official study. The scale value was determined by exploratory and confirmatory factor analysis (EFA and CFA) in structural equation modeling (SEM). The research framework includes these innovative features [13]. These metrics assess the proposed model's fit to the dataset. Common indications are as follows: (1) GFI > 0.90; (2) RMSEA < 0.08; (3) CFI > 0.90; (4) SRMR < 0.08; (5) CFI > 0.90; (6) Tucker-Lewis Index (TLI) or Non-Normed Fit Index (NNFI) > 0.90; and (7) Chi-Square/Degrees of Freedom (χ^2/df) < 5.0. To test the model and hypothesis, the authors created a standard scale and analyzed the SEM structure [13]. The compatibility of theoretical models and research assumptions is determined via SEM structural analysis. The authors combined purposive and random sampling strategies for the qualitative and quantitative phases, applying model test results to policy, detailed expert opinions, and more generalized views from company leaders. This study employs stratified random sampling to ensure representativeness across industries, firm sizes, and regions in Vietnam. SMEs were selected from manufacturing, services, technology, retail, and finance sectors, with firms categorized as small (<50 employees) or medium (50–300 employees). The sample includes businesses from Ho Chi Minh City, Hanoi, Da Nang, Can Tho, and Dong Nai, balancing urban and semi-urban representation. A target sample of 650 was invited, with 603 valid responses retained (92.76% response rate). This structured approach enhances the generalizability and reliability of the findings.

This study employs Structural Equation Modeling (SEM) to analyze the relationships between digital transformation, HRM, corporate culture, public relations, innovation, and competitive capacity in Vietnamese SMEs. SEM was chosen over traditional regression models due to its ability to analyze multiple relationships simultaneously within a single framework. Unlike OLS and multiple regression, SEM effectively handles latent variables, allowing constructs like corporate culture and digital transformation to be measured through various

observed indicators. Additionally, SEM accounts for measurement errors, ensuring higher reliability and validity in the analysis. The method also enables the study to examine direct and indirect effects, such as how digital transformation influences competitive capacity through HRM and corporate culture. Moreover, SEM allows for goodness-of-fit evaluation, using indices like CFI, RMSEA, and SRMR to validate the model. Compared to other statistical techniques, SEM provides deeper insights into mediation effects, revealing underlying relationships that regression models cannot capture. This study aligns with previous research in digital transformation and enterprise competitiveness, ensuring methodological consistency. The selection of SEM strengthens the robustness of findings, making the results more applicable to SMEs in Vietnam.

V. STUDY RESULTS

In the 4.0 era, emerging technologies such as big data, Internet of Things, artificial intelligence, blockchain will help Vietnamese small and medium enterprises (SMEs) maintain their competitive advantage by providing valuable information in system operations, improving the ability to forecast market demand, production planning thereby increasing labor productivity, optimizing production processes, improving customer care services, increasing profit margins. However, SMEs face many difficulties and challenges in digital transformation.

Based on an overview of the current competitiveness of Vietnamese enterprises in general and SMEs in particular, the article proposes many recommendations to promote the digital transformation process and improve the competitiveness of this sector in the current digital transformation period according to the General Statistics Office, by the end of 2024, about 79% of SMEs were in the initial stage of digital transformation, but were expected to make a breakthrough, contributing about 30 billion USD to GDP by 2024. Digital transformation activities take place at different levels depending on each functional department and the size of the enterprise. Regarding the application of digital transformation by function, only 1% of enterprises selling directly to customers use some digital sales methods regularly, either through social platforms or on the enterprise's website. 51% of enterprises use digital technologies in marketing, advertising, and promotion activities. About 25% are applied to administrative activities, and 4% to production planning. In fact, digital transformation activities of SMEs face some challenges, such as:

Firstly, lack of capital and information is considered the main challenge in promoting digital transformation in SMEs, especially enterprises in the manufacturing and agricultural sectors. Vietnam is a developing country; our country's digital infrastructure is still quite rudimentary regarding data and transmission speed. To promote the digital transformation process, it is necessary to invest more in infrastructure. This investment process cannot be implemented immediately, but it requires time and is costly. According to surveyed businesses, they had made significant investments in digitalization in 2024, and 28% intended to invest heavily in digitalization in the next five years. High investment levels, unclear economic benefits, and uncertainty about technology adoption are challenges to digitalization in Vietnam, especially for SMEs.

Second, there is a shortage of qualified and skilled workers for digital transformation.

This is also considered the main challenge for digital transformation in Vietnam at present and in the future. Digital transformation requires complex processes and technologies. Building and maintaining platforms requires many experts and trained workers. Our country is lacking these workers. According to the Ministry of Education and Training, the number of universities and colleges nationwide with IT training programs currently accounts for 37.5%, with about 50.000 students graduating each year. According to Topdev's "Vietnam IT Market Report 2025", about 30% of graduates can meet the professional requirements of businesses, while the remaining 70% need additional training from 3 to 6 months. Although Vietnam's IT human resources are highly appreciated, they have not been exploited sufficiently to ensure the quantity and quality to serve the needs of domestic technology development and be on par with other countries in the region. Vietnam lacked about 100.000 IT human resources; in 2024, businesses needed more than 400.000 IT human resources, which was 500.000 in 2024. This shortage comes from many causes, of which the leading causes are: training programs do not meet the requirements of businesses; technology changes too quickly, and schools cannot keep up to develop suitable training programs; the market needs highly skilled experts while new graduates lack practical skills and soft skills (teamwork, time management, communication skills...); IT human resources often lack communication skills and are not fluent in English.

Third, businesses lack awareness of the role of digital transformation.

Digital transformation requires business leaders to be willing to change, boldly abandoning the traditional business model to build a new business model, a new working process. However, according to a report by the Vietnam Federation of Commerce and Industry (VCCI), SMEs currently account for more than 97% of the total number of Vietnamese enterprises but have low technological innovation. According to a survey by the Ministry of Industry and Trade, up to 16 out of 17 surveyed industries are not ready to participate in digital transformation. Notably, more than 80% of businesses are just starting to learn about digital transformation. Recently, the concepts of "digital economy" and "digital transformation" have been mentioned a lot, but many SMEs still do not understand and apply them in practice. SME leaders hesitated in the digital transformation process due to a lack of vision and limited awareness of digital transformation. Most businesses have not yet built a clear digital transformation strategy consistent with the business strategy and resources, nor have they determined the appropriate direction for technology transformation.

Fourth, digital transformation can increase risks related to employment and discrimination.

The more we rely on technology, the less we rely on people. The more automated processes are, the less human resources are required. According to Cameron A et al., up to 38.1% of our country's current jobs could be transformed by automation by 2045. A more optimistic assessment is that about 15% of all jobs will be automated by 2033. In addition, digital transformation can also increase inequality in society: A 2024 World Bank report pointed out that digital transformation brings more benefits to the rich, but the poor benefit less from these technologies. Moreover, another weakness of the SME sector is the limited management and administration capacity. The number of enterprises managed scientifically, such as focusing on building business strategies as a basis for implementing long-term investment activities and building and promoting brands to establish a position in the domestic and international markets, is not much. Many enterprises, mainly private enterprises, limited liability companies, and small-scale joint stock companies, often handle business in a situational, short-term manner, even opportunistically, seeking profits by various illegal means (tax evasion, tax fraud, counterfeiting, counterfeiting, etc.). Lack of business capital is a common situation for SMEs. While access to credit capital from commercial banks is complex, the inevitable consequence is that the competitiveness in domestic and international markets of the majority of these enterprises is still low. Limited financial resources, management capacity, and innovation capacity lead to SMEs' low production and business efficiency, as shown by testing Cronbach's Alpha for factors in Table 1. A pre-test and pilot study was conducted before full data collection to ensure survey validity and reliability. The pre-test involved three academic experts reviewing the questionnaire for clarity and theoretical alignment, leading to minor refinements. A pilot study with 30 SME executives tested question comprehension and response accuracy. Cronbach's Alpha ($\alpha > 0.7$) confirmed internal consistency, while Exploratory Factor Analysis (EFA) validated construct alignment. Based on pilot feedback, ambiguous questions were refined, and the survey flow was optimized. The finalized questionnaire was then distributed to 650 business executives. This validation process ensured data reliability and methodological rigor.

This study employs Structural Equation Modeling (SEM) using AMOS 20.0 to analyze relationships between digital transformation, HRM, corporate culture, public relations, innovation, and competitive capacity in Vietnamese SMEs. SEM was chosen over traditional regression because it allows for direct and indirect effect analysis, enabling a deeper understanding of mediation effects. Unlike OLS regression, SEM accounts for latent variables such as corporate culture and digital transformation, improving measurement accuracy. Model validation was conducted through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to ensure construct reliability. Model fit indices were assessed, including CFI ≥ 0.90, RMSEA ≤ 0.08, and SRMR ≤ 0.08, confirming a good model fit. Chi-square ($\chi^2/df \leq 3.0$) ensured statistical alignment with observed data. Cronbach's Alpha ($\alpha > 0.7$) verified internal consistency across constructs. These validation steps enhance the robustness and credibility of the findings. SEM provides more substantial theoretical and empirical insights, making the results more applicable to SMEs in Vietnam.

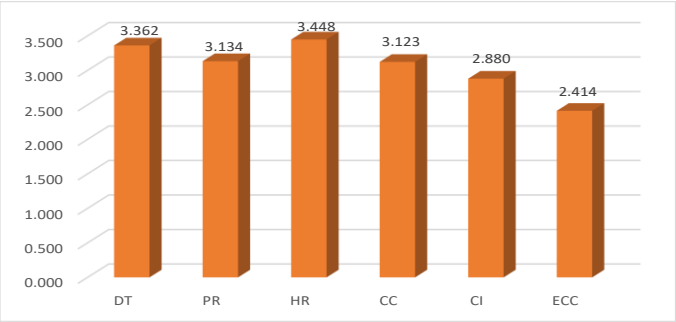

FIGURE 2. Mean value for factors affecting the enterprise's competitive capacity.

Figure 2 shows that corporate culture (3.123) and digital transformation (3.362) are the most critical determinants of company competitiveness in Vietnamese SMEs. Human resource management (3.448) ensures worker adaptation and digital preparedness. The mean values for creative innovation (2.880) and online public relations (3.134) are lower, indicating that innovation and branding techniques are underutilized. SMEs should focus on leadership adaptability, invest in AI-powered HRM, and boost their digital PR efforts. Strengthening these variables will boost business scalability and market competitiveness.

Table 1. Testing of Cronbach's Alpha for factors affecting the enterprise's competitive capacity.

Code	Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Human resource management (HR): Cronbach's Alpha is 0.848		-	-
HR1	Enterprises have a clear recruitment strategy and attract talent suitable to their development needs	0.697	0.803
HR2	Enterprises provide full training and professional skills development opportunities for employees	0.729	0.788
HR3	The company's salary, bonus, and welfare policies are fair, transparent, and competitive compared to the market	0.633	0.831
HR4	The performance evaluation system at the enterprise is transparent, fair, and accurately reflects the capabilities of employees	0.689	0.806
Corporate culture (CC): Cronbach's Alpha is 0.948		-	-
CC1	The business has a clear core value system, and employees understand and adhere to these values in daily work	0.907	0.922
CC2	Businesses build a positive working environment that encourages cooperation and support among employees	0.827	0.948
CC3	Businesses encourage a spirit of innovation and a willingness to test new ideas to improve business operations	0.862	0.936
CC4	Information within the business is communicated transparently, helping employees clearly understand the direction and common goals	0.907	0.922
Online public relations (PR): Cronbach's Alpha is 0.945		-	-
PR1	The business has a strong and easily recognizable brand image on online platforms	0.909	0.916

PR2	Businesses maintain a positive level of interaction with customers and the public through digital communication channels such as websites, social networks, and email	0.820	0.945
PR3	The business's online PR content is creative, attractive, and suitable for target customers	0.838	0.938
PR4	Businesses have effective strategies to monitor, handle negative feedback, and maintain brand reputation on online platforms	0.913	0.915
Digital transformation (DT): Cronbach's Alpha is 0.858		-	-
DT1	Enterprises actively apply digital technologies (AI, Big Data, Cloud Computing, IoT) to improve operational efficiency and decision-making	0.706	0.826
DT2	Business processes in enterprises are being automated, and data is being digitized to improve work efficiency	0.809	0.725
DT3	Businesses provide seamless digital customer experiences through online platforms and automated services	0.689	0.845
Creative innovation (CI): Cronbach's Alpha is 0.897		-	-
CI1	Enterprises continuously innovate and develop new products/services to meet market needs	0.817	0.850
CI2	Enterprises constantly improve production and operating processes to improve efficiency and reduce costs	0.692	0.897
CI3	Businesses can be flexible and adapt quickly to new trends, technological changes, and market fluctuations	0.819	0.850
CI4	Enterprises actively apply new technology (AI, Big Data, IoT, Blockchain...) to innovate business models and improve operational efficiency	0.763	0.870
Enterprise competitive capacity (ECC): Cronbach's Alpha is 0.870		-	-
ECC1	The business's products/services are clearly different and bring higher value than those of competitors	0.662	0.857
ECC2	Businesses operate efficiently, optimize costs, and maintain stable profits in a competitive environment	0.797	0.802
ECC3	Enterprises can be flexible and adapt quickly to market fluctuations and changes in customer needs	0.637	0.866
ECC4	The enterprise has a strong brand, stable market share, and solid competitiveness in the industry	0.798	0.803

Source: Own calculations in SPSS 20.0.

Table 1 shows the Cronbach's Alpha reliability test results for six major parameters influencing Enterprise Competitive Capability (ECC) in Vietnamese small and medium-sized firms (SMEs). The suggested study model will be evaluated using SPSS 20 software by evaluating data collected from a survey of owners and managers of small and medium-sized firms functioning in production and business from October to December 2024. A non-probability method is utilized to select the fewest samples according to the 5:1 rule via a Google Doc link delivered to online chat applications. The number of votes cast will be more than the number of samples. The minimum required to establish credibility in the data analysis procedure is 603 valid votes. Furthermore, the official scale includes 5 independent factors with 1 dependent factor equivalent to 22 observable variables and is measured on a 5-level Likert scale (Level 1 - strongly disagree to Level 5 - strongly agree). The results show good internal consistency across all constructs, which confirms the measurement scale's reliability.

(1) HR Management - Cronbach's Alpha: 0.848. HR is essential in promoting corporate competitiveness by assuring successful talent acquisition, employee development, and fair compensation. The Corrected Item-Total Correlation (CITC) scores for HR vary from 0.633 to 0.729, indicating moderate to strong correlations with the total HR construct. Notably, HR3 (fair and transparent salary policies) had the lowest correlation (0.633), suggesting potential differences in compensation judgments. The strong dependability score (α = 0.848) demonstrates that HR management considerably impacts competitive capability.

(2) Corporate Culture (CC) - Cronbach's Alpha: 0.948. CC has the highest reliability (α = 0.948), indicating its significant impact on competitive capacity. The CITC values vary from 0.827 to 0.907, with CC1 (core value adherence) and CC4 (transparent internal communication) having the highest correlations (0.907). This suggests that a well-defined company culture promotes employee alignment with organizational goals, increasing operational efficiency. The removal of CC2 (good work environment) would have little impact on reliability, implying that workplace collaboration is reinforcing but not the primary determinant.

(3) Online Public Relations (PR): Cronbach's Alpha: 0.945. A strong public relations strategy is essential for improving brand reputation and customer engagement in the digital age. The PR construct has excellent reliability (α = 0.945), with CITC values ranging from 0.820 to 0.913. PR1 (strong online brand image) and PR4 (effective crisis management) have the strongest correlations (0.909 and 0.913), indicating that brand consistency and reputation management are critical to PR effectiveness. Deleting PR2 (consumer engagement through digital media) would marginally impair reliability, demonstrating a secondary but complementary purpose.

(4) Cronbach's Alpha (0.858) indicates that digital transformation (DT) has a considerable impact on SMEs' ability to adapt to technological changes. The construct is reliable (α = 0.858), and CITC values range from 0.689 to 0.809. DT2 (business process automation) had the strongest correlation (0.809), highlighting the importance of digitized activities in increasing efficiency. DT3 (seamless digital customer experience) has a lower CITC (0.689), suggesting that customer-facing digitalization is still evolving. Removing DT2 would diminish total reliability, demonstrating its critical role in DT success.

(5) Creative Innovation (CI) Cronbach's Alpha: 0.897. CI has excellent reliability (α = 0.897), emphasizing the importance of innovation in maintaining competitiveness. The CITC scores range from 0.692 to 0.819, with CI3 (adaptability to market changes) and CI1 (continuous product/service innovation) earning the highest (0.819 and 0.817). These data show that SMEs that emphasize flexibility and innovation outperform competition. Interestingly, CI2 (process efficiency improvements) has the lowest correlation (0.692), indicating that, while operational efficiency is essential, its impact may be indirectly compared to strategic innovation.

(6) Cronbach's Alpha: 0.870, the dependent variable. Enterprise competitive capacity (ECC) is reliable (α = 0.870), indicating a stable measurement scale. The CITC values vary from 0.637 to 0.798, with ECC2 (operational efficiency and steady earnings) and ECC4 (brand and market position) having the most significant correlations (0.797 and 0.798). These findings demonstrate that profitability and brand strength are key indicators of competitive success. ECC3 (flexibility to market changes) has the lowest CITC (0.637), indicating that adaptability alone can not guarantee competitiveness unless accompanied by substantial financial and strategic positions.

The reliability study shows that the five independent variables (HR, CC, PR, DT, and CI) are valid and trustworthy indicators of competitive capacity. The findings highlight the relevance of corporate culture and public relations in determining SMEs' strategic posture. Future studies should investigate sector-specific implications and the dynamic interaction between digital transformation and innovation in fostering long-term SME competitiveness.

Table 2. Descriptive statistics for factors affecting the enterprise's competitive capacity.

Code	N	Minimum	Maximum	Mean	Std. Deviation
HR1	603	1	5	3.438	0.867
HR2	603	1	5	3.542	0.922
HR3	603	1	5	3.403	0.952
HR4	603	1	5	3.408	0.904
CC1	603	1	5	3.114	0.979
CC2	603	1	5	3.083	1.029
CC3	603	1	5	3.141	0.962
CC4	603	1	5	3.154	0.991
PR1	603	1	5	3.166	0.962
PR2	603	1	5	3.093	1.033
PR3	603	1	5	3.169	0.956
PR4	603	1	5	3.106	0.988

CI1	603	1	5	2.904	1.000
CI2	603	1	5	2.751	1.068
CI3	603	1	5	2.910	0.976
CI4	603	1	5	2.955	1.055
DT1	603	1	5	3.509	0.919
DT2	603	1	5	3.355	0.993
DT3	603	1	5	3.221	1.044
ECC1	603	1	5	2.362	0.676
ECC2	603	1	5	2.459	0.694
ECC3	603	1	5	2.398	0.655
ECC4	603	1	5	2.438	0.668

Source: own calculations in SPSS 20.0.

Table 2 displays descriptive statistics for factors influencing enterprise competitive capacity (ECC) based on a sample of 603 observations. The data contains each variable's minimum, maximum, mean, and standard deviation (SD) values, providing insights into the primary tendencies, variability, and overall distribution.

(1) Human resource management (HR) is critical for increasing corporate competitiveness through people acquisition, training, and equitable compensation. The highest mean score (3.542) for staff development emphasizes its importance in workforce optimization. However, wage rules (3.403) and performance evaluations (3.408) show room for improvement. Low standard deviations (≤0.95) indicate consistency in perceptions across firms. Improving HR methods can boost employee retention and productivity.

(2) Corporate culture (CC) promotes a collaborative and transparent work environment, but its mean values (3.083-3.154) suggest modest effectiveness. Internal communication (3.154) is quite good, whereas workplace cooperation (3.083) has the lowest mean and most significant variability (SD = 1.029). The high SD values (~1.00) indicate significant variances in cultural adaptation among enterprises. Improving corporate culture can boost employee engagement and organizational commitment.

(3) Online public relations (PR) help businesses improve brand awareness and customer involvement, with mean ratings ranging from 3.093 to 3.169. The highest-rated factor (3.169) is original PR content, whereas customer interaction (3.093, SD = 1.033) demonstrates discrepancies. High SD values (~1.00) suggest varying digital marketing success. Strengthening public relations strategies can improve competitiveness and public perception.

(4) Creative innovation (CI) is the weakest element in enterprise competitiveness, with mean scores ranging from 2.751 to 2.955. Technology adoption (2.955) is the most highly rated component, whereas process innovation (2.751, SD = 1.068) indicates implementation issues. Firms with high SD values (~1.00-1.07) exhibit different levels of innovation capability. More significant investment in R&D and digital transformation is required for long-term viability.

(5) Digital transformation (DT considerably impacts competitiveness, with average values ranging from 3.221 to 3.509. AI and Big Data adoption (3.509, SD = 0.919) is the most advanced field, whereas customer experience (3.221, SD = 1.044) lags behind. Moderate SD values imply that perceptions are generally consistent across firms. Expanding digital initiatives can help improve operational efficiency and market flexibility.

(6) Enterprise competitive capacity (ECC) has the lowest mean values (2.362-2.459), indicating weak market positioning and distinction. Cost optimization (2.459, SD = 0.694) is the most potent factor, but product/service originality (2.362) remains a significant weakness. Low SD values (~0.66-0.69) indicate widespread agreement on competitive difficulties. Strategic HR, innovation, and PR interventions are required for enterprise sustainability.

The findings show that HR and digital transformation are critical to increasing firm competitiveness, whereas corporate culture, public relations, and innovation require further improvement. The low ECC scores highlight the importance of focused policies and strategic initiatives to increase competitiveness, notably in innovation uptake, brand differentiation, and workforce empowerment. Future studies should investigate sector-specific dynamics, external economic factors, and long-term digital transformation trends to provide more significant insights into firm competitiveness in changing market conditions.

Table 3. Testing SEM model for factors affecting the enterprise's competitive capacity.

Relationships			Standardized estimate	Unstandardized estimate	S.E	C.R	P	Result
HR	→	DT	0.082	0.069	0.033	2.087	0.037	Accepted H2
CC	→	DT	0.622	0.548	0.035	15.623	***	Accepted H4
PR	→	DT	0.100	0.096	0.035	2.743	0.006	Accepted H5
DT	→	CI	0.115	0.103	0.038	2.698	0.007	Accepted H8
PR	→	CI	0.116	0.100	0.034	2.924	0.003	Accepted H6
PR	→	ECC	0.134	0.070	0.019	3.708	***	Accepted H7
HR	→	ECC	0.108	0.049	0.022	2.231	0.026	Accepted H1
CI	→	ECC	0.165	0.100	0.022	4.552	***	Accepted H3
DT	→	ECC	0.341	0.185	0.039	4.811	***	Accepted H9
CC	→	ECC	0.203	0.098	0.027	3.618	***	Accepted H10

Note *** denote statistical significances at 1%, processed from SPSS 20.0, Amos.

The structural equation modeling (SEM) results are shown in Table 3, which emphasizes the links between ECC, HR, CC, PR online, DT, CI, and HR. Digital transformation and PR are also highlighted. Standardized and unstandardized estimates, standard errors, critical ratios, and p-values are used to analyze the results.

Human Resource Management (HR) improves enterprise competitiveness (ECC) through worker development and equitable compensation. The SEM results suggest HR directly affects ECC ($\beta = 0.108$, $P = 0.026$) and moderately impacts digital transformation ($\beta = 0.082$, $P = 0.037$). This suggests that effective HR policies improve both competitiveness and digital adoption. However, it has a lower influence on DT than corporate culture (CC), implying that HR-driven digitalization may necessitate cultural reinforcement. To enhance HR's contribution to ECC, enterprises should prioritize staff upskilling and digital literacy.

(1) Corporate culture (CC) has a considerable impact on digital transformation ($\beta = 0.622$, $P < 0.001$), making it the strongest predictor. A strong company culture directly affects ECC ($\beta = 0.203$, $P < 0.001$), indicating that it improves digital adoption and competitiveness. A well-established corporate culture promotes transparency, adaptability, and innovation, which are essential for maintaining market competitiveness. The strong statistical significance of CC emphasizes its strategic value in corporate growth. Organizations should prioritize cultural development to foster digital transformation and long-term success. The results indicate that corporate culture (CC) significantly influences both digital transformation ($\beta = 0.622$, $p < 0.001$) and enterprise competitive capacity ($\beta = 0.203$, $p < 0.001$). SMEs with a culture of innovation, openness to change, and strong leadership support are more successful in adopting digital technologies and integrating them into HRM practices. On the contrary, firms with rigid, hierarchical cultures struggle to implement digital HRM systems, leading to inefficiencies. The study suggests that fostering a learning-oriented corporate culture, where employees are encouraged to embrace digital tools, upskill continuously, and collaborate in innovation, enhances a company's ability to compete in an increasingly digitalized market.

(2) Online public relations (PR) directly affect ECC ($\beta = 0.134$, $P < 0.001$), as well as DT ($\beta = 0.100$, $P = 0.006$) and CI ($\beta = 0.116$, $P = 0.003$). This demonstrates that a strong online presence helps to increase digital adoption, innovation, and competitiveness. Companies that efficiently manage online interactions are more likely to improve their brand reputation and stimulate innovation. PR's substantial impact on various factors implies that it is more than a marketing tool; it is a strategic driver of corporate success. Businesses should embrace data-driven digital communication strategies to fully realize PR's potential for boosting ECC.

(3) Creative Innovation (CI) has a direct impact on ECC ($\beta = 0.165$, $P < 0.001$), highlighting the importance of innovation in driving competitiveness. The study found that DT ($\beta = 0.115$, $P = 0.007$) and PR ($\beta = 0.116$, $P = 0.003$) impact enterprise innovation. Firms that invest in constant innovation, R&D, and adaptable strategies enjoy a long-term competitive advantage. The relatively significant influence of CI on ECC highlights the necessity of cultivating a culture of experimentation and creativity. Enterprises should aggressively embrace emerging technology and market trends to retain long-term resilience and leadership.

(4) Digital transformation (DT) is the most significant predictor of ECC (β = 0.341, P < 0.001), indicating that technological adoption directly improves firm competitiveness. The impact of CC (β = 0.622), PR (β = 0.100), and HR (β = 0.082) suggests that a supportive organizational structure promotes digitalization. DT significantly impacts invention (β = 0.115, P = 0.007), indicating that technical developments encourage creativity. The findings highlight how organizations that invest in AI, Big Data, and automation are better positioned for market success. Enterprises should pursue comprehensive digital transformation plans to optimize ECC. The study confirms that digital transformation (DT) is the strongest predictor of enterprise competitive capacity (ECC), with a standardized coefficient of β = 0.341, p < 0.001. SMEs that adopt digital tools, such as AI-driven HRM, cloud computing, and automation, demonstrate increased efficiency in human resource management, decision-making, and market responsiveness. However, the findings also highlight significant challenges: limited digital infrastructure, a shortage of skilled labor, and high implementation costs, which hinder the full-scale adoption of digital technologies in HRM. These insights emphasize the need for digital upskilling initiatives, investment in technological infrastructure, and government incentives to support SMEs in overcoming barriers to digital transformation.

(5) Enterprise Competitive Capacity (ECC), with the most significant being DT (β = 0.341) and CI (β = 0.165). Direct effects of CC (β = 0.203), PR (β = 0.134), and HR (β = 0.108) indicate that company culture, branding, and workforce development also impact competitiveness. The statistical relevance of all pathways underscores the need for a multifaceted strategy to improve ECC. To maintain their competitive advantage, businesses should invest in digitalization, innovation, and cultural development. The findings emphasize the significance of strategic alignment among technology, human capital, and corporate values in determining long-term organizational performance.

In conclusion, an enterprise's competitive capability is most strongly influenced by digital transformation, corporate culture, and innovation, according to the SEM analysis. To cultivate an environment encouraging technology adoption and long-term competitiveness, businesses should emphasize human resource development, public relations tactics, and enhancing corporate culture. Corporate culture acts as a key enabler of digital transformation. A digitally adaptive culture promotes employee engagement with technology, enhances organizational learning, and reduces resistance to change. SMEs prioritizing a proactive, innovation-driven culture experience smoother transitions to digital HRM, while companies with outdated management styles face delays and inefficiencies in digital adoption. These findings highlight the need for leadership training in building a digital-ready culture that fosters technological acceptance and long-term sustainability. This study highlights Vietnam as a unique context for SME digital transformation, offering insights specific to emerging economies. SMEs dominate Vietnam's

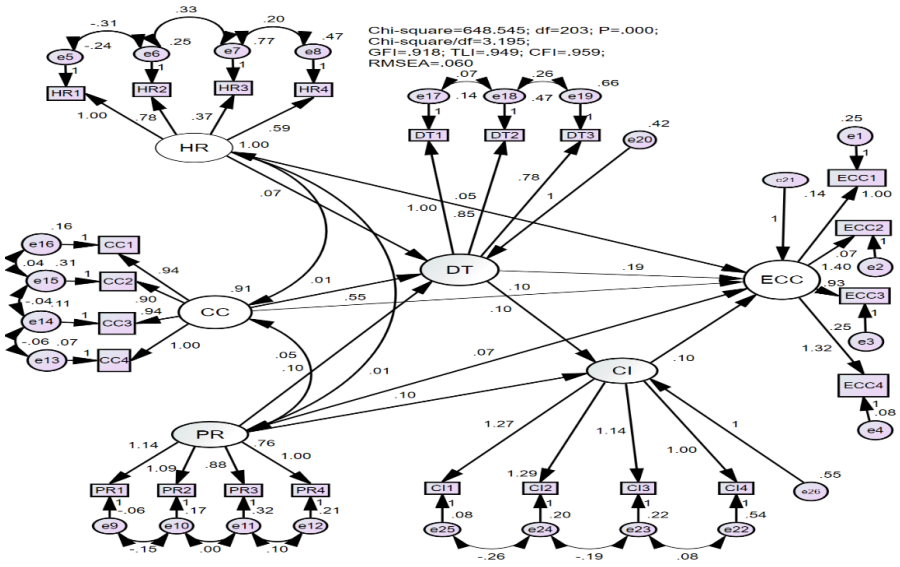

FIGURE 3. Testing SEM for factors affecting the enterprise's competitive capacity.

Source: Authors collected and processed from SPSS 20.0, Amos

economy but face infrastructure gaps, digital literacy challenges, and funding constraints. Findings show that corporate culture (β = 0.622) is crucial for overcoming resistance to digital adoption. Unlike developed markets, Vietnamese SMEs require more government incentives to accelerate HRM digitalization. These insights provide localized strategies to help Vietnamese businesses remain competitive.

Figure 3 depicts the significance threshold of 0.05 for assessing the enterprise's competitive capacity's five essential components. The following statistical metrics measured the model's fit: GFI = 0.918 (>0.900), TLI = 0.949 (>0.900), CFI = 0.959 (> 0.900), and RMSEA = 0.060 (< 0.08). According to the data presented above, research model testing showed five critical factors of the enterprise's competitive capacity in Vietnam: (1) Human resource management (HR), (2) Corporate culture (CC), (3) Online public relations (PR), (4) Digital transformation (DT), and (5) Creative innovation (CI). As shown in Figure 2, the results of the structural equation modeling (SEM) investigation into the interrelationships among ECC, Creative Innovation, online public relations (PR), Digital transformation (DT), and Human Resource Management (HRM) are presented. Through direct and indirect impacts, the model empirically verifies how these characteristics boost enterprise competitiveness.

(1) Enterprises that invest in AI, automation, and data-driven decision-making have a competitive edge, as confirmed by the findings that digital transformation (DT) is the strongest predictor of ECC (β = 0.341, P < 0.001). Adopting technology enhances one's ability to innovate, as demonstrated by the strong impact of DT on creative innovation (CI) (β = 0.115, P = 0.007). Rebuild a system of distribution channels suitable for each type of product, each market, and each business by eliminating distribution channels that are no longer suitable. With the vigorous development of information technology, companies should study and apply distribution systems through e-commerce trading floors.

(2) A well-defined company culture speeds up the adoption of technology, demonstrating the crucial importance of corporate culture (CC) in digital transformation (β = 0.622, P < 0.001). Furthermore, CC has a direct effect on ECC (β = 0.203, P < 0.001), indicating that overall competitiveness is improved in a work environment that is collaborative and adaptive. To meet market requirements, SMEs must invest in research and technology development, regularly updating, innovating, and applying technology to production business/supply activities. Enterprises choose technology suitable to the enterprise's scale of operation and production/supply process to promote operational efficiency.

(3) The significance of brand image, customer interaction, and digital marketing in determining competitive capacity is reflected in the positive impact of online public relations (PR) on ECC (β = 0.134, P < 0.001). PR is essential in driving innovation and digital strategy since it influences DT (β = 0.100, P = 0.006) and CI (β = 0.116, P = 0.003). Enterprises should create business links with enterprises in the same industry to expand production and business scale and have a production/service supply process that ensures both input and output at low cost and good product quality.

(4) Human resource management (HR) has a moderate impact on ECC (β = 0.108, P = 0.026) and a lower impact on DT (β = 0.082, P = 0.037). Although HR is still crucial, DT and CC do better to propel competitiveness. Organizations should combine HR policies with them to maximize the effect of digitalization initiatives. Enterprises must regularly develop training and development policies to reward and attract high-quality human resources and build a corporate culture to create a friendly and cohesive working environment. Focus on improving the qualifications of business leaders and management staff by regularly sending them to study and updating their knowledge and skills to organize and manage businesses to adapt and respond quickly and sensitively to changes in the business environment. The organization builds a business development strategy with a long-term vision of 10-20 years and a clear business plan for each period.

(5) The idea that continuous innovation is a critical factor in an enterprise's performance is supported by the fact that Creative Innovation (CI) directly enhances ECC (β = 0.165, P < 0.001). Companies that invest in research and development, new technologies, and the ability to adapt will be the ones that succeed in the long run. Focus on improving the qualifications of business leaders and management staff by regularly sending them to study and updating their knowledge and skills to organize and manage businesses to adapt and respond quickly and sensitively to changes in the business environment.

The SEM model verifies that branding, corporate culture, innovation, technology, and corporate culture interact intricately to form an enterprise's competitiveness. Both the CC → DT (β = 0.622) and DT → ECC (β = 0.341)

connections are the strongest, highlighting the importance of a corporate strategy that is driven by technology and accommodates many cultures. Businesses can boost ECC by emphasizing digital transformation, encouraging innovation, fortifying company culture, and improving online branding. Longitudinal trends and variability among sectors in these interactions need further investigation. While statistical significance (p-values) confirms the presence of relationships, effect sizes are crucial for understanding their practical impact. This study reports path coefficients (β values) from Structural Equation Modeling (SEM) to quantify the strength of relationships between key variables: (i) Digital transformation → competitive capacity ($\beta = 0.341$, $p < 0.001$) indicates a strong positive effect, showing that higher digital adoption leads to improved competitiveness. (ii) Corporate culture → digital transformation ($\beta = 0.622$, $p < 0.001$) suggests that a supportive corporate culture significantly enhances digital transformation success. (iii) Innovation → competitive capacity ($\beta = 0.165$, $p < 0.001$) reflects a moderate impact, highlighting the role of technological advancements in business performance.

This study proposes the Digital HRM Competitiveness Framework (DHCF) to explain how digital transformation in HRM enhances enterprise competitive capacity. The model integrates corporate culture, public relations, and innovation as key drivers of digital adoption and strategic agility. Findings show that corporate culture ($\beta = 0.622$) and digital HRM transformation ($\beta = 0.341$) significantly impact competitiveness. Unlike existing models, DHCF focuses on HRM-specific digitalization, bridging Dynamic Capabilities and Innovation Theory. This framework strengthens the study's theoretical novelty and practical relevance for SMEs.

VI. DISCUSSION OF FINDINGS

Presented in Table 3 are the empirical insights gained from the structural equation modeling (SEM) results regarding the complex interrelationships among ECC, creative innovation (CI), online public relations (PR), digital transformation (DT), corporate culture (CC), and human resource management (HR). Both direct and indirect effects are essential, and the results provide a solid foundation for determining how they affect a company's ability to compete. To improve clarity, the results are structured into three key themes. Digital transformation significantly enhances SME competitiveness ($\beta = 0.341$, $p < 0.001$), with AI-driven HRM, automation, and cloud-based strategies improving efficiency and market adaptability. Corporate culture is crucial in enabling digital adoption ($\beta = 0.622$, $p < 0.001$), as firms with flexible leadership and innovation-driven mindsets integrate HRM technology more effectively. Innovation also supports competitive capacity ($\beta = 0.165$, $p < 0.001$), emphasizing the importance of continuous investment in digital R&D. Public relations strategies contribute to brand positioning, reinforcing the external perception of digitally transformed SMEs. By categorizing findings, the study presents a structured, accessible analysis for academic and business audiences. This approach enhances readability, interpretation, and data-driven decision-making. Breaking down results into digestible themes ensures a more engaging and impactful presentation. Based on the results of testing factors influencing investment capital attraction and sustainable development, the authors discussed findings and proposed five policy implications for enhancing the enterprise's competitive capacity:

- HR's Effect on business advantage: The results show that HR has a favorable impact on ECC ($\beta = 0.108$, $P = 0.026$) and DT ($\beta = 0.082$, $P = 0.037$), suggesting that workforce development enhances corporate competitiveness through digital transformation as well as direct means [1, 3, 14, 36]. Human resources may not have as much effect as other elements, but when combined with technical integration and company culture, they can propel a company to competitiveness. Human capital is a strategic asset that boosts organizational capabilities when appropriately harnessed. These findings are in line with that view. On the other hand, HR isn't enough to ensure long-term competitiveness on its own; progress in technology and cultural flexibility is also necessary. This highlights the importance of HR strategies that are digitally driven and prioritize upskilling, talent management powered by AI, and continuous learning.
- Corporate culture (CC) in promoting digital change: A company's digital readiness is greatly influenced by its corporate culture, which is confirmed as the most critical factor in DT ($\beta = 0.622$, $P < 0.001$). Furthermore, the fact that CC has a notable direct impact on ECC ($\beta = 0.203$, $P < 0.001$) supports the claim that a well-organized corporate culture promotes flexibility, innovation, and long-term competitiveness [2, 4, 15, 37, 38]. Organizational flexibility and change-oriented leadership are crucial in digital transformation programs, as demonstrated by the substantial impact of CC on DT. These results state that companies that adapt to different

cultures can better react to changes in their environment by integrating new competencies, building on existing ones, and reconfiguring internal competencies. Businesses that value teamwork and new ideas are more likely to embrace automation, artificial intelligence, and data-driven decision-making, which boosts their ability to compete. To make the most of this impact, businesses should foster a culture hospitable to digital tools by promoting cooperation across departments, sharing information, and backing tech adoption from upper management.

- Online PR in driving digital transformation, innovation, and competitiveness: The significant effects of public relations on DT ($\beta = 0.100$, $P = 0.006$), CI ($\beta = 0.116$, $P = 0.003$), and ECC ($\beta = 0.134$, $P < 0.001$) demonstrate the multifaceted function of PR in corporate performance [9, 18, 25, 36, 37, 39, 41]. Based on these results, it seems that reasonable online PR efforts do more than just boost brand awareness; they also encourage people to use technology more and develop new ideas. This result states that companies may speed up the adoption of digital technologies and the diffusion of innovations if they put money into good communication strategies. A company's ability to innovate and successfully navigate digital transformation is impacted by the level of market knowledge and stakeholder involvement fostered by public relations efforts. It is becoming increasingly important to preserve a competitive advantage through digital branding, online reputation management, and social media engagement, as shown by the relatively significant influence of PR on ECC ($\beta = 0.134$). To use public relations as a competitive strategy driver, businesses should use marketing analytics powered by artificial intelligence, interactive digital campaigns, and crisis management tactics.
- Digital transformation (DT) best indicates an enterprise's competitiveness. DT is the most critical element in deciding an enterprise's competitive capability since it directly impacts ECC ($\beta = 0.341$, $P < 0.001$). This highlights the essential need for technology to enhance operational efficiency, decision-making, and market agility [19, 28, 26, 38, 39, 40, 41]. The fact that technology-driven disruptions give rise to new competitive advantages is highlighted in innovation theory, which is supported by the importance of DT → ECC. Through cost optimization, improved customer experiences, and accelerated product development cycles, firms that actively embrace AI, Big Data, blockchain, and cloud computing acquire a competitive advantage. Furthermore, the argument that digital adoption promotes innovation is further supported by the fact that DT affects CI ($\beta = 0.115$, $P = 0.007$). Businesses may try out new models, differentiate their products better, and respond faster to market demands by integrating automation, digital analytics, and cloud-based platforms. Enterprises need to invest in cybersecurity, digital literacy for their workers, and AI-driven decision-making to stay competitive.
- Cultural innovation (CI) in enhancing enterprise competitive capacity. CI significantly improves ECC ($\beta = 0.165$, $P < 0.001$), proving that innovation is key to maintaining a competitive advantage [20, 23, 35, 37, 40]. A company's competitiveness is enhanced when it can create innovative products, improve existing ones, and react quickly to changes in the market. Companies that innovate continuously outperform their rivals by setting new benchmarks for their industry. Both DT ($\beta = 0.115$, $P = 0.007$) and PR ($\beta = 0.116$, $P = 0.003$) impact CI, indicating that innovation is promoted by the combined effects of technology adoption and market involvement. Table 3 shows that CI means are relatively low; thus, it's clear that companies need to invest more in R&D, create more open innovation ecosystems, and use AI to boost their creativity and innovation.
- The research proves that the three most essential factors in an organization's ability to compete are digital transformation, corporate culture, and creative innovation. Dynamic capabilities and innovation Theories, this study adds to the existing literature on enterprise competitive capacity. A tech-driven and innovation-led strategy, supported by a digitally oriented corporate culture, is essential for organizations to remain competitive in the long run. Policymakers and business leaders who want to make their companies more resilient in the face of a digitally transformed world should pay attention.
- This study provides new insights by focusing on HRM-specific digital transformation, unlike prior research that examines general business digitalization. It highlights how AI, automation, and cloud-based HR systems enhance SME competitiveness, an overlooked area. The study also integrates corporate culture ($\beta = 0.622$) and digital PR strategies as key enablers of digital adoption, moving beyond isolated technology-driven approaches. Structural Equation Modeling (SEM) quantitatively validates relationships between HRM digitalization, corporate culture, innovation, and competitiveness. Additionally, it introduces the Digital HRM Competitiveness Framework (DHCF), combining Dynamic Capabilities and Innovation Theory to present a

comprehensive SME digital transformation model. Unlike existing frameworks, DHCF directly links HRM strategies to competitive capacity. Findings offer practical recommendations for SMEs, showing how workforce digitalization enhances agility and market positioning. Policymakers can use these insights to design HR-focused incentives for digital adoption. This study bridges theoretical gaps, offers empirical evidence, and provides actionable strategies. It contributes to academic literature and SME management practices, making it a valuable addition to digital transformation research.

- This study extends Dynamic Capabilities Theory (DCT) by positioning digital HRM as a core capability that enhances SME competitiveness through strategic adaptation and innovation. Unlike prior DCT applications, it highlights how AI-driven HRM and cloud-based workforce management improve organizational agility. Findings show that corporate culture ($\beta = 0.622$, $p < 0.001$) is a key enabler of digital transformation, emphasizing flexible leadership and digital learning initiatives. The study also integrates public relations and innovation into DCT, demonstrating their role in market positioning and enterprise resilience. SME leaders can leverage AI-powered HRM tools to enhance workforce efficiency and competitiveness. Policymakers should introduce HRM-focused digital incentives to support SMEs in adopting automation and data-driven HR strategies. Additionally, fostering innovation-driven corporate cultures can accelerate digital adoption and long-term growth. This study provides new academic insights and practical applications by linking HRM digitalization, corporate culture, and public relations into DCT. It positions SMEs as digitally competitive organizations in a rapidly evolving business environment. This study provides unique insights for Vietnamese SMEs, where digital transformation faces infrastructure and skill limitations. HRM digitalization is a key competitive advantage that improves productivity and workforce efficiency. Findings show that corporate culture ($\beta = 0.622$) drives successful digital adoption, emphasizing leadership adaptability and digital training. Public relations and innovation enhance brand positioning and market competitiveness in Vietnam's evolving economy. More substantial government support and IT infrastructure investment are needed to accelerate SME digital transformation. This study proposes the Digital HRM Competitiveness Framework (DHCF), which connects HRM digitalization, corporate culture, innovation, and PR into a holistic model. Unlike traditional DCT models, DHCF positions HRM as a critical driver of technological adaptation. This research fills a gap in digital transformation literature by focusing on SMEs, offering a new lens for understanding HRM's strategic role. The findings provide a theoretical foundation for future studies on HRM's impact on digital economies. This framework strengthens academic originality and offers practical guidance for businesses and policymakers.

VII. CONCLUSION AND RECOMMENDATIONS

The authors used a probability sampling method and a random sampling strategy for evaluation to gather information from 650 business executives (managers) through online interviews with a prepared questionnaire. Investigating the impact of many elements on the competitive capacity of the organization, this study's conclusions show the outcomes of a structural equation modeling (SEM) analysis. The results indicate that digital transformation, company culture, and innovative thinking should be the focal points of any effort to improve ECC. To get the most out of public relations and human resources, despite their supportive roles, you need to combine them with your digital and innovation strategies. To stay competitive long-term, businesses must use AI, be culturally adaptable, and innovate consistently. Companies must take a bird's-eye view of the situation and align their workforce competencies, market presence, and technological readiness with their long-term goals if they want the competition to be effective. Future research should focus on programs tailored to specific industries and government policies to keep companies competitive in the dynamic digital market. These findings contribute to the theoretical conversation around corporate competitiveness by integrating concepts from dynamic capabilities theory and innovation theory. A more practical and comprehensive strategy would benefit businesses; it would center on digital transformation, promote a culture of innovation, and employ public relations techniques to boost market engagement. Politician support for these endeavors can take the form of better digital infrastructure, incentives for R&D, and worker reskilling programs. Research on sector-specific variations, longitudinal studies, and external macroeconomic variables can help develop strategies for long-term corporate competitiveness. Boosting Vietnam's enterprise competitive capacity in light of the findings mentioned above:

- Improve digital transformation (DT) → ECC (β = 0.341) → highest priority: Businesses prioritize DT because it has the most significant influence on Enterprise Competitive Capacity (ECC) (β = 0.341, P < 0.001). The fact that it affects Creative invention (CI) (β = 0.115, P = 0.007) further supports the idea that embracing technology promotes invention. Companies that use automation, AI, and Big Data are more efficient, save money, and can respond quickly to changes in the market. DT is essential for businesses that want to grow sustainably, not merely as an operational tool. The average DT ratings (3.221-3.509) show that companies understand its value but struggle to fully use it. Businesses may get the most out of it if they put money into digital education, automation, cybersecurity, and AI-guided decisions. According to DT's powerful effect, Enterprises risk falling behind in competitive markets if they do not adopt digital strategies. To improve ECC, firms should emphasize digital infrastructure and tech-driven business models. SMEs should implement AI-driven recruitment, performance tracking, and workforce analytics to streamline HRM operations. Automating payroll, attendance, and employee engagement reduces administrative workload and enhances efficiency. AI tools provide data-driven insights to optimize talent management and improve retention rates. Investing in chatbots for HR support can enhance employee experience and responsiveness. These tools help SMEs stay competitive in a digital-first economy. SMEs should use government grants, tax incentives, and digital transformation funds. Engaging with industry associations and policymakers helps shape pro-business digital policies. Participation in public-private partnerships provides access to funding and training programs. Understanding local and international regulatory frameworks ensures compliance and competitive advantage. Leveraging these resources accelerates digital adoption and business growth. Finally, policymakers should support SME competitiveness by introducing digital HRM training programs tailored to Vietnam's context. These should include modules on AI-based recruitment systems, cloud-based HR information systems, and data-driven performance evaluation. In addition, the government should incentivize SMEs to adopt these tools through tax breaks, subsidies, or technical support. Further, campaigns to raise awareness about the strategic value of digital HRM among SME leaders are crucial.
- Improve corporate culture (CC) → DT (β = 0.622) → critical for digital readiness: CC has a foundational role in enabling competitiveness as it dramatically affects Digital Transformation (DT) (β = 0.622, P < 0.001) and directly affects ECC (β = 0.203, P < 0.001). Improved technology integration, decision-making, and workforce alignment can be achieved by fostering a collaborative, flexible, and innovation-driven culture. A company's capacity to accept change is enhanced by a clearly defined corporate culture, as shown by the high reliability of CC (α = 0.948, Table 1). Table 2 shows that many organizations have difficulty creating an atmosphere conducive to innovation, based on the mean CC scores of 3.083 to 3.154. Supporting agility, digitization, and sustainability requires a leadership-driven culture shift to close this gap. Businesses should prioritize information sharing, flexible work conditions, and cross-functional cooperation to boost CC. There may be pushback against digital transformation and innovation attempts if the underlying culture is weak. Leadership should promote digital literacy through continuous training programs for employees. A culture of innovation and adaptability enables SMEs to embrace digital transformation effectively. Offering performance-based incentives for digital adoption encourages workforce engagement. Integrating collaborative digital tools fosters efficient communication and knowledge sharing. A strong digital culture reduces resistance to technology adoption in organizations.
- Improve creative innovation (CI) → ECC (β = 0.165) → key for sustainable competitiveness: Maintaining market leadership requires ongoing innovation, which is driven by CI (β = 0.165, P < 0.001). However, according to the low mean CI ratings, many businesses have trouble implementing innovation plans (2.751-2.955, Table 2). When companies stop innovating, they risk becoming less competitive and eventually losing market share. Digital tools expedite invention, as DT favors CI (β = 0.115, P = 0.007). It is highlighted that market-driven initiatives improve innovation capacity, and PR also plays a significant role in CI (β = 0.116, P = 0.003). To maintain a competitive edge, businesses should enhance their investment in research and development, encourage digital innovation, and join open innovation ecosystems. The Government needs to provide more incentives to increase the adoption of innovations, and the private sector needs to work together. Companies that put money into disruptive innovation models have a better chance of experiencing long-term growth in the market. Developing in-house digital innovation hubs allows SMEs to experiment with emerging technologies. Collaborating with universities and tech startups fosters cross-industry knowledge exchange. Investing in AI, blockchain, and cloud-based

solutions enhances business agility and efficiency. Regular innovation workshops and hackathons can cultivate a culture of continuous improvement. Long-term investment in R&D ensures SMEs remain competitive in evolving markets.

- Improve online public relations (PR) → ECC (β = 0.134) → branding and market engagement: PR has a direct effect on ECC (β = 0.134, P < 0.001), showing that it helps improve the brand's reputation, positioning in the market, and trust from stakeholders. Additionally, it has a favorable impact on DT (β = 0.100, P = 0.006) and CI (β = 0.116, P = 0.003), indicating that successful public relations tactics accelerate digitalization and innovation. Businesses that actively participate in public life and have a solid online reputation are better able to draw in investors, keep their customers loyal, and stay ahead of the competition. Table 2 shows PR's mean scores range from 3.093 to 3.169, suggesting businesses should work on digital marketing and customer engagement tactics. Organizations should implement better online reputation management, social media analytics, and AI-powered public relations technologies. Outperforming rivals are possible for businesses combining public relations with digital and innovation strategies. Businesses may adapt to the ever-changing market with the help of a data-driven public relations strategy that focuses on the client. To enhance market visibility, SMEs should leverage social media, digital marketing, and AI-driven branding strategies. Engaging in content marketing and online storytelling improves customer loyalty and brand recognition. AI-powered chatbots and recommendation engines can personalize customer interactions. Employee advocacy programs can humanize the brand and build credibility. A well-executed digital PR strategy differentiates SMEs from competitors.
- Improve human resource management (HR) → ECC (β = 0.108) & HR → DT (β = 0.082) → moderate impact: Workforce development is essential, but not the main factor driving competitiveness, according to HR's moderate influence on ECC (β = 0.108, P = 0.026) and DT (β = 0.082, P = 0.037). Increased output, more substantial employee buy-in, and more responsiveness to technological shifts are all hallmarks of HR-savvy businesses. The lower standardized estimations show that HR's impact is less than that of DT and CC. Although HR policies are somewhat effective, they still require improvement, according to the mean scores (3.403-3.542, Table 2). Aligning HR with digital transformation initiatives requires investments in digital upskilling, continuous learning, and AI-driven talent management. The full potential of digital adoption and innovation strategies could be missed if the workforce is not tech-savvy. Human resources must transition from an administrative role to a strategic facilitator of business change. Arrange and organize job positions following the human resources of the enterprise. Develop job descriptions and standards for each job position to quickly check and measure the work results of employees in a transparent manner, creating fairness and motivating work. Regularly update and train employees in skills, professional knowledge, expertise, research skills, and technology application in the enterprise's production - business and supply activities. It is necessary to regularly foster foreign languages, information technology, culture, and international business laws, particularly for enterprises with export capabilities and those operating in the service sector.

VIII. LIMITATIONS AND FUTURE RESEARCH

This study has certain limitations but is still quite robust. First, it can't be applied to other economic situations because it only covers Vietnamese businesses. Secondly, longitudinal studies are required since the cross-sectional design limits the ability to draw causal conclusions. Third, objective performance measures are necessary because self-reported data could be biased. Fourth, a comprehensive perspective is hindered because external macroeconomic factors are not thoroughly examined. Since competitive dynamics differ between sectors, industry-specific insights are also missing. The study's breadth and depth could be improved by addressing these shortcomings in future research. Future studies should use longitudinal designs to better understand how DT, CC, and CI affect competitiveness over time. The contextual factors can be better understood through cross-cultural research that compares developed and emerging economies. For precision, objective performance indicators ought to supersede self-reported data. For a more holistic view, look into technological upheavals and macroeconomic policies. Differences in digital transformation between sectors can be better understood by industry-specific analyses. AI, blockchain, and the Internet of Things can show how they contribute to competitiveness. Following these guidelines can better grasp the enterprise's competitive capacity. This study acknowledges several methodological limitations that may affect its findings. The cross-sectional design captures data at a single point, limiting the ability to establish causality in the relationships examined. Self-

reported data may introduce response bias, as participants could overstate digital adoption. While the sample covers various industries and regions, results may not fully generalize to larger enterprises or other economies. External factors like government policies and economic shifts could also influence SME competitiveness. Future research should consider longitudinal studies and objective performance indicators to strengthen findings. Expanding the study to diverse organizational sizes could improve its external validity. This study acknowledges potential sample biases in industry, region, and firm digital maturity. SMEs in technology and finance may have higher digital adoption, while rural enterprises could be underrepresented. Major economic hubs like Ho Chi Minh City and Hanoi dominate the sample, limiting insights from smaller provinces. Self-selection bias may also favor firms already engaged in digital transformation. Future research should expand industry and regional coverage to improve representativeness. While this study provides valuable insights into the relationship between digital transformation, HRM, and SME competitiveness, its cross-sectional design limits the ability to establish causality. Future research should consider a longitudinal approach to track digital transformation adoption and its long-term impact on business performance over time. By adopting a longitudinal design, future research can strengthen causal claims and offer more actionable insights for SMEs and policymakers navigating digital transformation. This study primarily relies on self-reported survey data from business executives, which, while valuable, may introduce response bias. Future research should incorporate objective business performance indicators alongside self-reported insights to improve measurement accuracy. Future research can validate findings, improve reliability, and offer more actionable business insights by integrating self-reported and objective data. Future studies will include many new aspects, such as leadership styles, financial investment in technology, and regulatory regulations, which all substantially impact digital transformation outcomes. Strengthening the theoretical rationale for these choices would improve the study's contribution. Although the study adopted stratified random sampling across various sectors and regions, the data is cross-sectional and self-reported, primarily from business managers. Therefore, there is potential social desirability bias, as respondents may present overly optimistic perspectives. Moreover, the generalizability of the results to other types of firms or contexts (e.g., large enterprises or other developing countries) should be approached with caution. Future studies should consider using longitudinal data or triangulating with employee-level and third-party assessments.

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Author Contributions

The authors made contributions to the development and planning of the study. The authors did everything equally; Lu Phi Nga wrote the conception, method and design, and data analysis. Phan Thanh Tam wrote critical revisions of intellectual content and the final approval version.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data is available from the authors upon request.

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Appendix

Table A1. Research questionnaires

Code	Items	5-point Likert scale
Human resource management (HR):		(1) (2) (3) (4) (5)
HR1	Enterprises have a clear recruitment strategy and attract talent suitable to their development needs	(1) (2) (3) (4) (5)
HR2	Enterprises provide full training and professional skills development opportunities for employees	(1) (2) (3) (4) (5)
HR3	The company's salary, bonus, and welfare policies are fair, transparent, and competitive compared to the market	(1) (2) (3) (4) (5)
HR4	The performance evaluation system at the enterprise is transparent, fair, and accurately reflects the capabilities of employees	(1) (2) (3) (4) (5)
Corporate culture (CC):		(1) (2) (3) (4) (5)
CC1	The business has a clear core value system, and employees understand and adhere to these values in daily work	(1) (2) (3) (4) (5)
CC2	Businesses build a positive working environment that encourages cooperation and support among employees	(1) (2) (3) (4) (5)
CC3	Businesses encourage a spirit of innovation and a willingness to test new ideas to improve business operations	(1) (2) (3) (4) (5)
CC4	Information within the business is communicated transparently, helping employees clearly understand the direction and common goals	(1) (2) (3) (4) (5)
Online public relations (PR):		(1) (2) (3) (4) (5)
PR1	The business has a strong and easily recognizable brand image on online platforms	(1) (2) (3) (4) (5)
PR2	Businesses maintain a positive level of interaction with customers and the public through digital communication channels such as websites, social networks, and email	(1) (2) (3) (4) (5)
PR3	The business's online PR content is creative, attractive, and suitable for target customers	(1) (2) (3) (4) (5)
PR4	Businesses have effective strategies to monitor, handle negative feedback, and maintain brand reputation on online platforms	(1) (2) (3) (4) (5)
Digital transformation (DT):		(1) (2) (3) (4) (5)
DT1	Enterprises actively apply digital technologies (AI, Big Data, Cloud Computing, IoT) to improve operational efficiency and decision-making	(1) (2) (3) (4) (5)
DT2	Business processes in enterprises are being automated, and data is being digitized to improve work efficiency	(1) (2) (3) (4) (5)

DT3	Businesses provide seamless digital customer experiences through online platforms and automated services	(1) (2) (3) (4) (5)
Creative innovation (CI):		(1) (2) (3) (4) (5)
CI1	Enterprises continuously innovate and develop new products/services to meet market needs	(1) (2) (3) (4) (5)
CI2	Enterprises constantly improve production and operating processes to improve efficiency and reduce costs	(1) (2) (3) (4) (5)
CI3	Businesses can be flexible and adapt quickly to new trends, technological changes, and market fluctuations	(1) (2) (3) (4) (5)
CI4	Enterprises actively apply new technology (AI, Big Data, IoT, Blockchain...) to innovate business models and improve operational efficiency	(1) (2) (3) (4) (5)
Enterprise competitive capacity (ECC):		(1) (2) (3) (4) (5)
ECC1	The business's products/services are clearly different and bring higher value than those of competitors	(1) (2) (3) (4) (5)
ECC2	Businesses operate efficiently, optimize costs, and maintain stable profits in a competitive environment	(1) (2) (3) (4) (5)
ECC3	Enterprises can be flexible and adapt quickly to market fluctuations and changes in customer needs	(1) (2) (3) (4) (5)
ECC4	The enterprise has a strong brand, stable market share, and solid competitiveness in the industry	(1) (2) (3) (4) (5)