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## **Human capital, digital transformation, and firm performance of startups in Vietnam**

### 1. Introduction

Under the negative impact of the Covid-19 epidemic, the firm performance of businesses in Vietnam in general decreased and enterprises were at high risk of bankruptcy and dissolution. More specifically, the number of enterprises withdrawing from the market in the first 7 months of 2021 continued to increase, with 79,673 enterprises, an increase of 25.5% over the same period in 2020. There were 40,251 enterprises temporarily suspending business, accounting for 50.5% of total enterprises withdrawing from the market in the first 7 months of 2021 (Cuc Quan ly kinh doanh, 2021). In order to support startups, the Government of Vietnam has adopted various policies to reform, innovate and improve the business environment as stipulated in legal documents. Facing that situation, many businesses have responded to the Covid-19 pandemic by training employees in digital skills, applying automation measures, and finding new supply chains. In the vision to 2030, Vietnam would become a digital

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country, comprehensively innovating production, and business activities of enterprises. For digital transformation, businesses need to create a foundation for digital transformation, transform awareness to develop a digital platform. According to a survey of the World Bank (2020), Vietnam has up to 58% of Vietnamese enterprises switching to digital platforms. This shows that digital transformation is no longer an option but has become a mandatory requirement, accelerating the digital transformation process is important in improving stability and ensuring future growth. In fact, the speed of digital transformation of Vietnamese enterprises is still slow. Some reasons can be mentioned include lack of professional knowledge in technology, lack of financial capital and lack of awareness of digital transformation of leaders. They are big barriers affecting digital transformation for Vietnamese businesses.

The research issue of digital transformation of businesses has been of interest from researchers around the world. SMEs implement digital transformation to drive business model innovation to improve performance (Bouwman et al., 2019). Information technology capabilities deliver operational results through the mediating role of digital transformation (Nwankpa & Roumani, 2016). Digital transformation has opened up many opportunities for innovation and entrepreneurship (Nambisan et al., 2019). However, most startups lack capacity and limited resources in the early stages of operation, startups cannot afford to do digital transformation on their own. Small and medium enterprises transform digitally through: (1) support from digital platform service providers, (2) innovation in management awareness, (3) development of managers' social capital, (4) building sales team and (5) building organizational capacity (Li et al., 2018). Fenech et al. (2019) suggested that digital transformation requires human capital, intellectual capital, and knowledge as critical components in order to improve the competitive advantage of firms. Specific human capital is the condition of digital transformation of business organizations (Polyanin et al., 2019).

Some theories are used from previous research such as human resource theory (Nwankpa & Roumani, 2016), dynamic capacity theory, organizational capacity (Li et al., 2018). The above theories explain the internal resources of businesses that help with digital transformation. However, the theory of managers' human capital has not been mentioned to explain digital transformation for startups, especially in a transition economy like Vietnam. This study aims to fill the above research gap. In this study, digital transformation aims to cope with the crisis before the negative impact of the Covid-19 epidemic when limited capacity is

a big barrier to digital transformation for startups in Vietnam. Therefore, human capital plays an important role in digital transformation for startups. This study has two main contributions:

The first contribution is to explore the new relationship between social capital, digital transformation, and firm performance of startups in Vietnam.

The second is to explore the mediating role of digital transformation between human capital and firm performance of startups in Vietnam.

## **2. Theoretical background and research hypothesis development**

### **2.1. Human capital theory**

When human capital theory is applied in the field of entrepreneurship, human capital contributes to the success of entrepreneurs (Unger et al., 2011). Human capital is crucial in discovering and creating business opportunities (Marvel, 2013), exploiting business opportunities (Dimov, 2010), acquiring new knowledge and creating competitive advantages for new businesses (Bradley et al., 2012).

Human capital theory includes general human capital (experience and education) and specific human capital (industrial experience, self-employment experience, and self-employment experience and leadership experience) (Becker, 1964). Human capital theory shows that it is personal characteristics that help entrepreneurs get into business in the early stages of difficulty (Foss, 1994). Marvel (2013) classified human capital into two categories: human capital investments (education, experience/training, recruitment) and human capital outcomes (knowledge, skills, and abilities). Skills are the output of human capital. Skills applied in entrepreneurship can provide an advantage in the process of starting a business (Marvel, 2013). Skills are developed through an investment in training or experience. It can be developed in a combination of education and practice.

### **2.2. Digital transformation**

Digital transformation refers to the changes and transformations that are driven by the foundation of digital technology. Digital platforms including big data analytics, cloud, social media, mobile platforms and promoted smart solutions, reshaping business models and organization reinvestment strategies (Pagani, 2013; Serageldin & Dasgupta, 2001). Digital transformation is the change that builds on the foundation of digital technology, unleashing unique

changes in business operations, business processes and value creation (Libert et al., 2016).

Within an enterprise, digital transformation is defined as an organizational shift to big data, cloud, mobile and social media platforms in response to a changing market landscape. Libert et al. (2016) argued that digital technology help increase efficiency in business processes of enterprises, completely change business activities, create value, and provide new digital products. Through digital transformation, organizations can integrate digital technology in many aspects of their operations and also attract customers (Aral & Weill, 2007). Businesses that have successfully adopted digital transformation are more likely to generate revenue using their existing resources (Westerman et al., 2014).

### **2.3. Firm performance**

Jin (2017) defined firm performance of a startup as the result obtained when effectively using the enterprise's resources. Ju et al. (2019) argued that the firm performance of a startup is understood as the achievement of the initial set goal (revenue, market share, etc.) and is highly appreciated by partners.

Enterprises have to accomplish different objectives within a certain period of time, expressed in terms of efficiency, productivity, quality, and responsiveness. The performance of the business is measured in terms of non-financial aspects. In this respect, performance should focus on indicators such as satisfaction of employees, customers, perception of the success and growth of the business, future development prospects and the achievement of initial goals of the entrepreneur (Reijonen & Komppula, 2007). Chandler and Hanks (1994) measured non-financial performance through satisfaction of business owners, customers, employees, good relationships with suppliers, cohesive working environment, accepted products/services in the market and created corporate image.

Because in the early stages of operation, financial indicators are still low, the performance of startups should be measured by non-financial criteria, mainly measured by perceived level of the entrepreneur compared to the original goal.

### **2.4. Hypothesis development**

#### **2.4.1. Human capital and digital transformation**

Digital transformation requires businesses to have digital skills and digital management resources. Therefore, it is very necessary to develop human capital

that will accelerate the digital transformation process. Nwankpa and Roumani (2016) argued that digital transformation thanks to IT capabilities. In addition, digital transformation requires business team building and organizational capacity building (Li et al., 2018). Thus, digital transformation requires digital management skills for leaders/managers, transforming the perception of digital managers, building digital transformation receivers, testing digital transformation and information technology capabilities. Therefore, hypothesis H3 is proposed:

Hypothesis H1: *Human capital is positively related to digital transformation.*

#### **2.4.2. Human capital and firm performance**

The resource-based theory (Barney, 1986) explains why superior human capital can lead to sustainable performance advantages for companies. Valuable resources bring long-term performance to the business. Otherwise, competitors will compete for the advantage that the firm may have (Peteraf, 1993). Knowledge associated with human capital is one of the most common resources (Kogut & Zander, 1992). Derived from resource – based theory, knowledge embedded inside people is only source of competitive advantage (Grant, 1996).

In general, human capital is viewed as a source of value, both at the management level and at the individual level. The reason is that it is unevenly distributed among firms and is often shorted since an above-average CEO is rare indeed (Harris & Helfat, 1997). Finally, it is difficult for competing firms to value, copy or acquire human capital (Coff, 2002). Accordingly, businesses with high human resources will outperform other businesses. Hypothesis H2 is proposed:

Hypothesis H2: *Human capital is positively related to firm performance.*

#### **2.4.3. Digital transformation and firm performance**

As digital transformation increases, businesses can achieve improved customer offerings, increased customer satisfaction, and reduced cost of sales (Mithas et al., 2005). Previous studies have shown that digital technology has a positive effect on business performance. Businesses that use a lot of business processes with digital technology will achieve greater efficiency (Brynjolfsson & Hitt, 2000). Businesses are using digital technologies to improve efficiency

through synchronizing data, information, and ideas (Setia et al., 2013). Therefore, hypothesis H3 is stated as follows:

Hypothesis 3: *Digital transformation is positively related to firm performance.*

#### 2.4.4. The mediating role of digital transformation

Startups often lack resources and have limited capacity in the early stages of operation (Tran Nha Ghi et al., 2021). For digital transformation, startups need a workforce with digital skills and IT capabilities to apply in their business operations. Nwankpa and Roumani (2016) shown that in order to transform digitally, it is necessary for businesses to have IT capabilities and contribute to business results. In addition, businesses that apply digital technologies in business processes will gain higher efficiency (Brynjolfsson & Hitt, 2000, Setia, Setia, Venkatesh, & Joglekar, 2013). Therefore, digital transformation is expected to act as an intermediary between human capital and firm performance. Hypothesis H4 is proposed:

Hypothesis 4: *Digital transformation mediates the positive relationship between human capital and firm performance.*

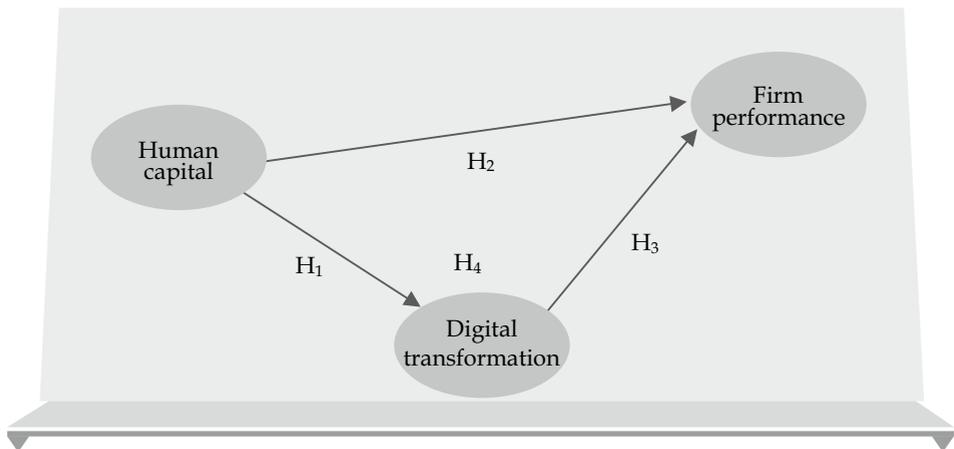


Figure 1. Research model

Source: own study

### 3. Methods

#### 3.1. Research process

The research was conducted through qualitative, preliminary, and quantitative research methods:

*Qualitative and preliminary quantitative research:* through online interviews with 9 experts who are the board of directors (directors and deputy directors). The scale used in this study was calibrated through interviews with each expert in order to be suitable for the research context. Next, the scale is tested with 115 members of the companies' board of directors to check the reliability and convergent validity.

*Quantitative research:* Bootstrapping technique with  $N = 5000$  is used to test the hypotheses. This step is used to evaluate the measurement model and the structural model. The measurement model is evaluated through testing of scale reliability, composite reliability, convergent validity, and discriminant validity. The structural model is evaluated through the following criteria: coefficient of determination ( $R^2$ ), predictive relevance ( $Q^2$ ) and effect size ( $f^2$ ).

#### 3.2. Measures

In the model, there are three constructs: human capital, digital transformation, and firm performance. The human capital scale is adjusted based on the research of Volodymyr et al. (2021) and is measured by six items. The digital transformation scale is measured by three items, inherited from Aral and Weill (2007). Firm performance scale is measured by four items, inherited from Ju et al. (2019). All items were utilized a 5-point Likert scale: (1) Totally disagree, (2) Oppose, (3) Neutral, (4) Agree, and (5) Totally agree (see table 1).

**Table 1. Constructs and scale resources**

Constructs	Symbol	Number of observations	Sources
Human Capital	HC	6	Volodymyr et al. (2021)
Digital Transformation	DT	3	Aral and Weill (2007)
Firm performance	FP	4	Ju et al. (2019)

**Source:** own study

### 3.3. Sample

The units of analysis are businesses that apply digital technologies such as big data, analytics, cloud, mobile, and social media platforms. The units of observation are the board of directors (directors/deputy directors) of businesses. The official research sample was collected by convenient sampling method, online survey via Google form. Before sending the questionnaire, the author actively contacted and received the approval from the board of directors, and the survey questionnaire was sent to a personal email address. The results of the online survey show that there are 230 respondents, of which 230 are valid. Therefore, the study used 230 observations as the formal sample for this study. The study used the partial least squares structural model PLS-SEM to analyze the data. With the advantage of allowing small sample data and processing data that do not follow the normal distribution, this method should be used in this study (Hair et al., 2016).

## 4. Results

### 4.1. Sample characteristics

The research sample is 230 observations, respondents are the board of directors of startups in Vietnam. Regarding the type of operation, the number of private enterprises is 67 (29%), limited liability companies is 58 (25%), joint stock companies is 71 (31%) and the rest which consists of other types is 34 (15%). In terms of field of operation, the number of startups operating in the commercial sector is 97 (42%), in the manufacturing sector is 81 (35%) and in the service sector is 52 (29%). In terms of labor size, the number of startups with a labor size of less than 10 is 15 (7%), from 11 to 30 is 65 (28%), from 31 to 50 is 105 (46%) and the rest which has from 54 or more is 45 (20%). Regarding the information of survey respondents, there are 112 male (49%) and 118 female (51%). The number of respondents with undergraduate degree is 82 people (36%), with university degree is 117 (51%) and with postgraduate degree is 31 (13%).

**Table 2. Sample characteristics**

Characteristics		Frequency	%
Gender	Male	112	49%
	Female	118	51%

Education level	High school/College	82	36%
	University	117	51%
	Postgraduate	31	13%
Labor size	Under 10	15	7%
	From 11 to 30	65	28%
	From 31 to 50	105	46%
	Over 51	45	20%
Field of operation	Manufacturing sector	81	35%
	Commercial sector	97	42%
	Service sector	52	23%
Type of business	Private enterprises	67	29%
	Limited liability companies	58	25%
	Joint-stock companies	71	31%
	Others	34	15%

Source: own study

## 4.2. Scale evaluation

Table 3 presents the results of testing Cronbach's alpha reliability, composite reliability (CR), average variance extracted (AVE) of all scales. The scales with Cronbach's alpha ( $\alpha$ ) and composite reliability are larger than the threshold:  $\alpha_{FP} = 0.854$ ,  $\alpha_{DT} = 0.839$ ;  $\alpha_{HC} = 0.854 > 0.6$  and;  $CR_{FP} = 0.901$ ,  $CR_{DT} = 0.903$ ;  $CR_{HC} = 0.893 > 0.7$  (Hair Jr et al., 2019). Average variance extracted (AVE) of the scales ( $AVE_{HC} = 0.585$ ;  $AVE_{DT} = 0.756$ ;  $AVE_{FP} = 0.695$ ) are all above 0.5. These results support the reliability of all scales according to the standards of Hair Jr et al. (2019). The results also show that factor loadings of all items are above 0.7. Therefore, all items satisfy the convergent validity from the perspectives of Hair Jr et al. (2019).

**Table 3. Measurement items**

Constructs and items	Mean	SD	Standardized loading
<b>Firm performance (FP):</b> Cronbach's Alpha (CA): 0.854, composite reliability (CR): CR = 0.901; average variance extracted (AVE) = 0.695			
We have obtained stable orders and realize stable increase of operating income (FP1)	3.687	1.026	0.845
we have achieved the goal set at the beginning of my venture (FP2)	3.683	0.932	0.819
Peers and friends are highly complementary about my entrepreneurship (FP3)	3.548	0.985	0.732
We gain the trust of customers and partners (FP4)	3.470	0.917	0.835
<b>Digital Transformation:</b> CA = 0.839; CR = 0.903; AVE = 0.755			
We are driving new business processes built on the foundation of digital technologies such as big data, analytics, cloud, mobile and social media platforms (DT1)	3.517	0.959	0.887
We are integrating digital technologies like social media, big data, analytics, cloud, and mobile technologies to drive change (DT2)	3.465	1.003	0.851
Our business is moving to use digital technologies such as big data, analytics, cloud, mobile and social media platforms (DT3)	3.522	0.986	0.869
<b>Human capital:</b> CA = 0.854; CR = 0.893; AVE = 0.585			
We always raise awareness of digital transformation (HC1)	3.778	1.058	0.837
We always develop ourselves and digital management skills (HC2)	3.813	1.057	0.736
We are always developing digital capabilities (HC3)	3.926	1.025	0.830
We are always improving adaptability and mobility (HC4)	3.561	1.040	0.810
We always develop digital culture (HC5)	3.630	1.091	0.772
We always improve our creative and intellectual capacity in digital technology (HC6)	3.548	0.962	0.575

**Source:** own study

Table 4 presents the results of the discriminant validity test of constructs according to Fornell and Larcker (1981). Discriminant validity was further approved by virtue of the square root of the average variance extracted (AVE) of each construct surpassing its correlations with the other constructs.

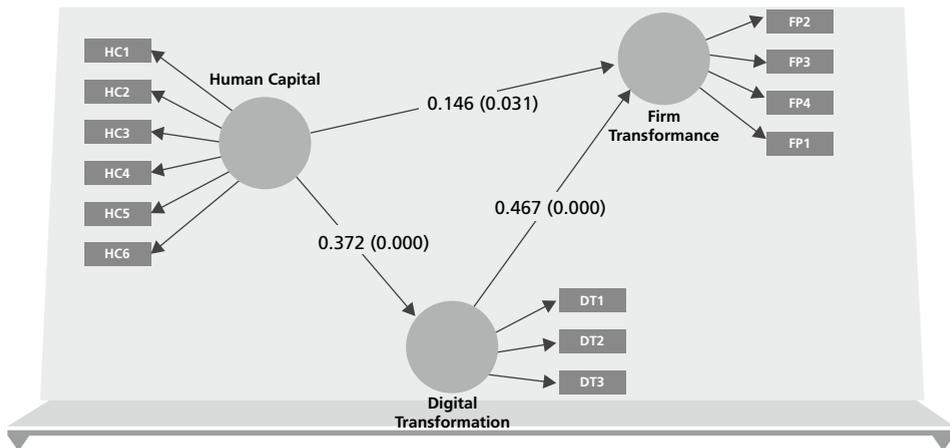
**Table 4. Fornell – Lacker criterion**

	Mean	SD	1	2	3
1. Digital transformation	3.501	0.983	0.869		
2. Firm performance	2.624	0.919	0.340	0.800	
3. Human capital	3.595	0.965	0.523	0.321	0.834

Source: own study

### 4.3. Estimation results

The model estimation results by Bootstrapping method with sample size of 5000 is shown in figure 2.



**Figure 2. Estimation model**

Source: own study

Table 5 presents the test results of the theoretical model. The quality of the proposed model is evaluated through  $R^2$  and Stone-Geisser ( $Q^2$ ) values. The coefficient of determination ( $R^2_{FP} = 0.139$ ) which is lower than 0.26 and according to Cohen (2013) is considered moderate. The value for Stone-Geisser ( $Q^2_{FP} = 0.195$ ) ranged between (0.02; 0.35), which indicates that the prediction level of model is moderate (Chin, 2010). Moreover, the level of influence ( $f^2$ ) between the components ranged between (0.02, 0.35), and according to the criteria of Henseler et al. (2009) is moderate.

**Table 5. Hypothesis testing**

Hypothesis	Description of path	$\beta$	Bootstrapping	SD	t	Confidence Intervals	P-value	VIF	Conclusion
Direct effect									
H1	HC → FP	0.146	0.149**	0.069	2.130	[0.012; 0.279]	0.031	1.161	Supported
H2	HC → DT	0.372	0.380***	0.060	6.192	[0.260; 0.494]	0.000	1.000	Supported
H3	DT → FP	0.467	0.467***	0.067	6.973	[0.33; 0.590]	0.000	1.161	Supported
Indirect effect									
H4	HC→DT→FP	0.174	0.177	0.038	4.537	[0.107; 0.255]	0.000		Supported
$R^2_{FP}$		0.139							
$f^2$		$f^2_{HC \rightarrow FP} = 0.026$ ; $f^2_{HC \rightarrow DT} = 0.161$ ; $f^2_{DT \rightarrow FP} = 0.264$							
Stone-Geisser's $Q^2$		$Q^2_{DT} = 0.102$ ; $Q^2_{FP} = 0.195$							

\*\*\* p < 1%, \*\* p < 5%, \* p < 10%

**Source:** own study

Hypothesis H1 on the positive link between human capital and firm performance was supported through the positively significant coefficient (H1:  $B = 0.149$ ;  $p = 0.033 < 0.05$ ). Hypothesis H2 positing the positive link between human capital and digital transformation was statistically evidenced because of the positively significant coefficient (H2:  $B = 0.380$ ;  $p = 0.000 < 0.01$ ). There was a positive relationship between digital transformation and firm performance (H3:  $B = 0.467$ ;  $p = 0.000 < 0.01$ ), which provided endorsement for hypothesis H3.

The indirect effect of human capital on firm performance via the mediating channel of digital transformation was 0.15 (SE = 0.022,  $p < 0.01$ ). The result of Bootstrapping demonstrated that 95% confidence interval (CI) varied from 0.023 to 0.111 without zero being included in the range, which further supported hypothesis H4 regarding the mediation path of digital transformation underlying the relationship between human capital and firm performance.

## 5. Discussion

The above results are similar to the results from previous studies. For instance, human capital is positively related to firm performance (Alnoor, 2020; Peng & Luo, 2000). In addition, digital transformation has a positive impact on firm performance. Previous studies have suggested that digital transformation based on IT capabilities helps businesses improve firm performance (Nwankpa & Roumani, 2016). Moreover, social capital is also suggested in contributing to the promotion of digital transformation of enterprises (Li et al., 2018). Previous research suggested that human capital plays an important role in digital transformation of firms (Fenech et al., 2019).

However, there is a scarcity of studies examining the relationship between human capital, digital transformation and firm performance of startups during the Covid-19 pandemic. In this study, human capital helps startups in digital transformation and contributes to firm performance to escape the Covid-19 crisis. In this crisis period, startups need to change their business strategies, in which digital transformation is the optimal solution for startups to access markets and customers, when social distancing policies are applied by the Government. However, digital transformation in startups is not easy to implement when their capacities are limited. Therefore, human capital plays an important role in digital transformation and contributes to firm performance. Managers must raise awareness of digital transformation and self-development, digital management skills and create a digital culture environment for businesses, develop digital capabilities for adaptive capacity and mobility. Finally, creativity and intelligence capacities play an important role in the transformation of startups.

## 6. Conclusion and limitations

The study applied human capital theory to explain the digital transformation of startups. Through human capital, startups drive digital transformation and

improve firm performance. The research results show that the hypotheses proposed in the theoretical model are accepted. This study has offered both theoretical and practical contributions.

### **6.1. Theoretical implications**

First, the study has examined the relationship between human capital, digital transformation, and firm performance of startups in a transition economy like Vietnam. Digital transformation is driven by human capital within the organization. Research results have tested the positive relationship between human capital and digital transformation, which is the new relationship tested in this study.

Second, the research results have discovered the mediating role of digital transformation between human capital and the firm performance of startups.

### **6.2. Practical implications**

The research results have offered practical implications for startups. For startups, it is important to focus on improving human capital. In some digital transformation training programs of the Government, startups need to actively monitor and participate to receive training to improve digital capabilities and digital skills. Moreover, for strong digital transformation, business leaders need to be aware of and responsible for digital transformation, build digital transformation identity and test it. On a platform equipped with information and resources from external support organizations, startups need to develop digital infrastructure such as IoT, 5G networks, electronic payment systems. Startups also need to consider collaborative research, develop, and innovate in the digital business environment.

In addition, human capital demonstrated through digital skills and capabilities is very important in the digital transformation process. Therefore, managers of startups need to raise awareness of digital transformation and develop a digital culture for the organization. From a personal perspective, managers need to improve their digital capabilities and digital management skills to adapt to the market. At the same time, startups need to cultivate and develop creative and intellectual capabilities to research and develop more complete digital services.

### 6.3. Limitations and suggestions for future research

The survey sample in the study is startup businesses operating in many industries, so the study has not found the specificity of each industry. Digital transformation will depend on each type of industry; especially sectors such as engineering, high technology, information technology requires stronger digital transformation than others. Therefore, further studies need to re-test the above relationship for specific industrial sectors.

Social capital theory is used to explain the formation of external resources to promote digital transformation. The digital transformation process also contributes to promoting business model transformation. Therefore, in the next studies, it is necessary to examine social capital, digital transformation, and business model innovation of startups in developing economies.

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### Abstract

Based on social capital theory, the study explained the digital transformation process of startups in Vietnam. The primary object of this study is to examine the relationship between human capital, digital transformation, and firm performance of startups in Vietnam. The study applied Partial Least Squares Structural Model (PLS-SEM) with a sample size of 230 managers. The results demonstrated the positive relationships between human capital, digital transformation, and firm performance. The study explored digital transformation as a mediation mechanism between human capital and firm performance. The results provided some managerial implications for managers to focus on improving human capital in order to promote digital transformation and firm performance. This is an important strategy to help startups escape the crisis of Covid-19 pandemic. Finally, the study presented some limitations and directions for further research.

**Keywords:** *Human capital, Digital transformation, Firm performance.*

**JEL**

**classification:** D91, M13, M15, L53.

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