

## SOCIAL CAPITAL AND DIGITAL TRANSFORMATION OF STARTUPS IN VIETNAM DURING THE COVID-19 PANDEMIC: THE MEDIATING ROLE OF HUMAN CAPITAL AND ACCESS TO RESOURCES

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### Abstract:

Based on social network theory, the study explained the digital transformation process of startups in Vietnam during the outbreak of the COVID-19 pandemic. The study examined the relationship between social capital, human capital, access to resources, and digital transformation of startups in Vietnam. The study used Partial Least Squares - Structural Equation Modelling (PLS-SEM) with a sample size of 230 startups managers. The results show that there are positive and statistically significant relationships between social capital, human capital, access to resources, and digital transformation. The results also reveal the partial mediating roles of access to resources and human capital in the relationship between social capital and digital transformation. The results proposed some managerial implications for startups managers in building relationship networks with stakeholders such as government agencies and business partners (customers, competitors, suppliers, and providers of digital platform services). Through managers' social capital, accessible resources and the improvement of human capital have accelerated digital transformation for startups to escape the crisis of the COVID-19 pandemic. Finally, the study presented some limitations and directions for further research.

**Key words:** *access to resources, digital transformation, human capital, social capital*

### INTRODUCTION

The outbreak of the COVID-19 pandemic in Vietnam has severely affected the production and business activities of various enterprises. Many businesses have stopped operating because sales and service provision has decreased sharply, the number of customers has decreased significantly because of the difficulty in reaching customers. Many businesses cut operating costs (reduce wages and payments, reduce personnel, etc.) to maintain their existence. The year of 2021 is forecasted to be a difficult year for the world economy due to the impact of the COVID-19 epidemic. In order to create favorable conditions for start-up businesses in the context of difficulties and challenges, Vietnam government has adopted policies to reform, innovate and improve the business environment specified in Decree 01/2021/ND-CP issued on January 4, 2021, and

Resolution 02/NQ-CP issued on January 1, 2021. In the first two months of 2021, the number of newly established enterprises reached 18,129, up 4% over the same period in 2020. The increase in the number of enterprises with large, registered capital shows that the confidence of the business community has been improved. This contributes to promoting current start-up business activities in the context of the COVID-19 pandemic, which still has many complicated developments.

According to a report by the Vietnam Chamber of Commerce and Industry (VCCI), Vietnamese businesses have adjusted towards digital transformation with many digital tools being applied. Many businesses have responded to the COVID-19 pandemic by training digital skills for employees, applying automation measures, and finding new supply chains. In the vision to 2030, Vietnam will become

a digital country with comprehensively innovating production and business activities of enterprises. The COVID-19 pandemic has created major changes in the behavior of both consumers and businesses as activities are shifted to online.

For digital transformation, businesses need to create a foundation for digital transformation, transforming awareness to developing a digital platform. The COVID-19 pandemic has pushed businesses in Vietnam to digitally transform to get out of the crisis. According to a survey by the World Bank (2020), Vietnam has 58% of Vietnamese businesses switching to digital platforms. The most used digital platform in Vietnamese businesses is applied to corporate governance, followed by marketing, payment methods, sales, and production planning. The COVID-19 pandemic highlights the importance of applying technology, improving the quality of the customer experience, artificial intelligence, and data analytics. This forces businesses to admit that digital transformation is no longer an option but has become a mandatory requirement in order to ensure future growth.

In fact, the speed of digital transformation of Vietnamese enterprises is still slow. Some reasons can be mentioned are lack of professional knowledge in technology, lack of financial capital and digital transformation awareness of the managers. However, many Vietnamese enterprises have approached digital transformation for businesses with work management software applications, cloud computing, chatbots and social networks. Lack of skills, lack of financial and human resources (for example, information technology capabilities) and awareness of transformation are major barriers affecting digital transformation for Vietnamese enterprises.

The issue of digital transformation research of businesses has been of interest from researchers around the world. Li, et al. [1] conducted research on digital transformation for small and medium startups enterprises. Small and medium enterprises (SMEs) implement digital transformation to drive business model innovation to improve performance [2]. Digital transformation affects innovation and entrepreneurship in the tourism industry [3]. Information technology capabilities deliver operational results through the mediating role of digital transformation [4]. Digital transformation has opened up many opportunities for innovation and entrepreneurship [5]. Entrepreneurial human capital drives business model innovation through the mediating role of resource access [6]. Human capital and social capital play vital roles in improving entrepreneurial performance of 1398 Vietnamese new-born firms [7]. Prem [8] studied the changes of components in business model with the specific characteristics of digital technologies in Industry 4.0. Finally, Xie, et al. [9] studied SMEs' business model innovation to be enhanced by digital platforms via the mediating mechanisms of capability reconfiguration.

The above review shows that digital transformation plays an important role in enterprise innovation [3, 4, 5]. In addition, digital transformation also creates many opportunities for business model innovation [10, 11]. Thus, digital

transformation is implemented to help businesses adapt to the COVID-19 pandemic and get out of the crisis. However, since most startups lack capacity and have limited resources in the initial stages of operation, they cannot afford to have digital transformation on their own. Thanks to the relationship network of managers, businesses have the ability to digitally transform via accessible resources and enhanced human capital. For example, SMEs digitally transform through: (1) support from digital platform service providers, (2) innovation in management awareness, (3) social capital development of managers, (4) business team building and (5) organizational capacity building [1]. Some theories are applied in previous research such as human resource theory [4], dynamic capacity theory and organizational capacity theory [1]. The above theories explain the internal resources of businesses that support digital transformation. However, the theory of social network, social capital and human capital of managers have not been mentioned to explain the formation of external resources to promote digital transformation for startups, especially in a transitional economy like Vietnam. This study was conducted to fill in the above research gap. In this study, digital transformation aims to cope with the crisis from the negative impact of the COVID-19 epidemic. Under the negative impact of COVID-19, limited capacity and resources are big barriers to digital transformation for startups in Vietnam. Therefore, managers' social capital plays a significant role in accessing external supporting resources and improving human capital to promote digital transformation for startups. This study has three main contributions:

First, to explore the new relationship between managers' social capital, human capital, access to resources and digital transformation of startups in Vietnam.

Second, to explore the mediating role of access to resources between social capital and digital transformation of startups in Vietnam.

Finally, to explore the mediating role of human capital between social capital and digital transformation of startups in Vietnam.

## **THEORETICAL BACKGROUND AND RESEARCH MODEL**

### **Social network theory**

Networks are understood as knowing the "right people" and making connections with each other to accomplish and achieve individual and organizational goals [12, 13]. In addition, networking is also considered in terms of self-efforts in personal communication in order to benefit from external opportunities [14] or efforts to cooperate with partners and stakeholders to gain and sustain competitive advantage [15].

The core of social network theory is that individuals tend to think and act alike. In network theory, a set of relationships (individuals, groups, or organizations) are formed, and the entire set of relationships can be applied in explaining social behavior to stakeholders [16]. Individuals acquire social capital through job placement in social networks [17]. The strength of a relationship depends on the amount of time spent in that relationship and the mutual exchange between individuals in the social network.

### Social capital

Social capital has been studied at many levels such as individual [14], organizational [18], and social [19]. Social capital theory is the network of relationships created or resulted, resources can be used for the benefit of individuals or groups [20]. In this study, social capital is addressed at the individual level. At this level, social capital is defined as the resources associated with one's relationships with others, actual or potential benefit that a person accrues from his or her network of formal and informal relationships with others [14].

### Human capital

The concept of human capital is related to individuals' knowledge and abilities [21]. Human capital can be developed through formal training and education aimed at updating and renewing one's capacity to function well in society. Human capital theory has been applied in the field of entrepreneurship and human capital contributes to the success of entrepreneurs [22]. Human capital is crucial in discovering and creating business opportunities [23], exploiting business opportunities Dimov [24], acquiring new knowledge and creating competitive advantages for new businesses [25]. Researchers have previously distinguished different types of human capital [26]. Human capital is divided into three categories: firm-specific human capital, industry-specific human capital, and Individual-specific human capital. In this study, individual-specific human capital is mentioned.

Individual-specific human capital refers to knowledge that is applicable to businesses and industries; it includes general business and management experience [27], education and skill level [28], and the age of individuals [29]. [29] discussed the human capital model for success and suggested that business success is positively related to training and business experience. In addition, Prais [30] examined how a country's education and training system can promote overall productivity.

In this study, human capital is defined as the awareness of managers about digital transformation, developing digital management skills, digital capabilities and digital culture, improving adaptability and mobility, creative and intellectual capacity in digital technology [31].

### Access to external support resources

From the social capital of individuals, resources are approached in different aspects. From a resource theory-based perspective, resources refer to all types of tangible and intangible assets such as finance, raw materials, labor, technology and organization [32]. Research by Ju, et al. [33] identified resources accessible from the network including finance, materials, technology, and human capital. New businesses often have to rely on external resources to set up and grow successfully. Access to entrepreneurial resources includes access to financial capital, knowledge, information and additional partners [34], information/knowledge, new partners and financial support [6].

### Digital transformation

Digital technologies such as analytics, big data, cloud, social media, mobile platforms and smart solutions are driving and reshaping business models and organization's reinvestment methods [19, 35].

Digital transformation refers to the changes and transformations that are driven by the foundation of digital technology. Within an enterprise, digital transformation is defined as an organizational shift to big data, analytics, cloud, mobility, and social media platforms. While organizations are constantly transforming and evolving in response to the changing market landscape, digital transformation is the changes built on the foundation of digital technology, opening up unique changes in business operations, business and value creation processes [36]. Libert, et al. [36] argued that digital transformation is the use of digital technology to increase efficiency in an enterprise's business processes and that digital transformation occurs when digital technology is used to completely transform business operations, create value, and deliver new digital products. Through digital transformation, organizations can integrate digital technology in many aspects of their operations and can also engage customers with digital innovation [37]. Businesses that have successfully adopted digital transformation are more likely to generate revenue using their existing resources [38]. Therefore, businesses have accepted digital transformation to be able to effectively use digital connectivity and communication to spread among key partners in the value chain [4].

### Research hypothesis development

#### *Social capital and digital transformation*

In an unstable business environment, firms will rely on managers' social capital [39]. In a transitional economy, where legal institutions are weak and information is not publicly available, managers' social capital plays an important role [40]. Therefore, informal enterprises must rely on networks with parties such as government officials, business partners and social networks [40], state-owned enterprises [41]. Nguyen, et al. [42] argued that the network plays a vital role in the transitional economy. Network of relationships can bring some resources to help businesses survive and develop [43, 44].

Moreover, during the COVID-19 outbreak, many businesses were severely affected. The Government issued Directive No. 11/CT-TTg dated March 4, 2020, on urgent tasks and solutions to remove difficulties for production and business, ensure social security, and respond to the COVID-19 pandemic. Digital transformation is the solution to help businesses get out of crisis to develop new markets, easily reach customers, and cut operating costs. Businesses with good relationships with government agencies will easily access information on training policies to improve digital skills, digital management for leaders/managers and information technology capabilities. For instance, information technology capabilities are required to implement an effective digital transformation strategy [37, 45]. Firms build information technology capabilities to enable higher digital transformation in products, services and other activities in value chain [46]. Firms

with superior information technology capabilities can create digital transformation by redesigning existing business processes and converting traditional products, services, customers to digital services [4]. Digital transformation requires firms to have digital skills, financial resources to invest in digital platforms and personnel management digital model. Thank to managers' social capital, firms could easily access information and supporting resources to promote digital transformation. SMEs' digital transformation is carried out through social capital development of managers [1]. Therefore, hypothesis H<sub>1</sub> is suggested:  
*Hypothesis H<sub>1</sub>: Social capital has a positive relationship with digital transformation.*

#### *Social capital and human capital*

Through the manager's social capital, human capital is also improved. In the early stages of operation, startups are limited in capacity. Thanks to the social capital of the managers, startups will easily access information and external support resources [47]. Gustafsson and Autio [48] have emphasized the importance of community network to advance technology structuring and discovered valuable applications for new technologies. In Vietnam, startups are supported in the initial stages. Startups build a good network of relationships with government agencies and their managers will be supported with free training to improve their competencies, skills, professional and digital expertise. Therefore, social capital also contributes to the enhancement of human capital. Hypothesis H<sub>2</sub> is proposed:

*Hypothesis H<sub>2</sub>: Social capital has a positive relationship with human capital.*

#### *Human capital and digital transformation*

Digital transformation requires firms to have digital skills and digital management. Therefore, it is very essential to utilize human capital that will accelerate the digital transformation. Nwankpa and Roumani [4] claimed that digital transformation based on IT capabilities. Additionally, digital transformation requires business team building and organizational capacity building [1]. 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. Ghi, et al. [49] suggested that human capital has a positive impact on digital transformation of startups in Vietnam. Therefore, hypothesis H<sub>3</sub> is proposed:

*Hypothesis H<sub>3</sub>: Human capital has a positive relationship with digital transformation.*

#### *The mediating role of access to resources between social capital and digital transformation*

For digital transformation, start-ups need a lot of external support resources. In the early stages of operation, startups lack operational resources [6]. Moreover, during the crisis period due to the impact of the COVID-19 epidemic, startups are even more limited in resources for digital transformation. Li, et al. [1] also shown that small and

medium enterprises also have limited resources and capacity for digital transformation. Therefore, managers' access to supporting resources through social capital or a network of social relations with stakeholders such as government agencies, support organizations, digital service providers, etc. is very necessary. Thanks to the social capital of the manager, digital transformation is made possible by accessible resources. Accessible resources include information, resources, and financial resources [34, 47, 50]. Therefore, access to resources is expected to act as a mediator between social capital and digital transformation and the hypothesis H<sub>4</sub> is proposed:

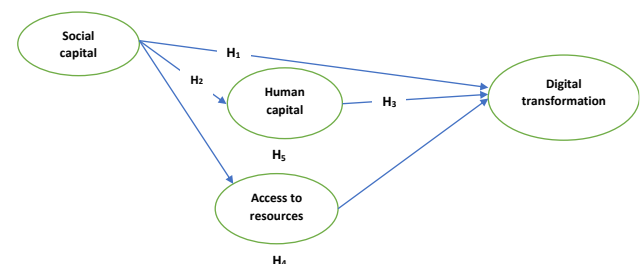
*Hypothesis H<sub>4</sub>: Access to resources has a mediating role between social capital and digital transformation.*

#### *The mediating role of human capital between social capital and digital transformation*

Human capital is improved through managers' social capital. Through a network of relationships with Government agencies, employees are guided by the national digital transformation program to improve digital awareness and digital management skills. According to Rodchenko, et al. [31], human capital in digital transformation is required such as digitalization perception, development of digital competencies, development of digital culture and creative and intellectual factors. Under the negative influence of the COVID-19 epidemic and in the initial stages of operation, startups lack skills and capabilities, social capital plays an important role in improving the skills and capabilities of workers in startups. As a result, human capital is improved, digital transformation is carried out to adapt to market changes. Therefore, human capital is expected to act as a mediator between social capital and digital transformation. Therefore, hypothesis H<sub>5</sub> is proposed:

*Hypothesis H<sub>5</sub>: Human capital has a mediating role between social capital and digital transformation.*

Based on the above arguments to form research hypotheses, the research model is proposed at Figure 1.



**Fig. 1 Proposed research model**

## **RESEARCH METHODOLOGY**

### **Research process**

The research is carried out through qualitative, preliminary, and quantitative research methods:

*Qualitative and preliminary quantitative research:* conducted through online interviews with 9 experts who are in the board of directors (directors and deputy directors). The scale used in this study was calibrated through interviewing each expert in order to adjust to the research context. Next, pilot study was applied with 115 members of

companies' board of directors to check the reliability and convergent validity of the scale.

*Quantitative research:* applied Bootstrapping technique with  $N = 5000$  to test the hypothesis. 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 ( $f^2$ ).

### Scale measurement

In the model, there are three research concepts: social capital, human capital, access to resources and digital transformation. The social capital scale is inherited from Peng and Luo [40], measured with 4 observed variables. The human capital scale is adjusted based on the study of Rodchenko, et al. [31] and is measured by 6 observed variables. The scale of access to resources is inherited from the studies of Semrau and Werner [34] and Ghi, et al. [6]. The digital transformation scale is measured by 3 observed variables, inherited from the study of Weill and Aral [37]. Observed variables are measured using a 5-point Likert scale: (1) Totally disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Totally agree (see Table 1).

**Table 1**  
*Scale of research concepts in the model*

| Scale                  | Symbol | No. of observed variables | Source of scale        |
|------------------------|--------|---------------------------|------------------------|
| Social Capital         | SC     | 4                         | Peng and Luo [40]      |
| Human Capital          | HC     | 6                         | Rodchenko, et al. [31] |
| Digital Transformation | DT     | 3                         | Weill and Aral [37]    |
| Access to resources    | AR     | 3                         | Semrau and Werner [34] |

### Sample

*Sample selection criteria:* Analysis units are businesses with digital technology applications such as big data, analytics, cloud, mobile and social media platforms. The survey subjects are the board of directors (directors/deputy directors) of the enterprise.

*Sampling method:* The 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.

*Data analysis method:* The study applied partial least squares structural model PLS-SEM to analyze data. Because of the advantage of the method that allows processing of small sample data, data that do not follow the normal distribution [51], this method was selected for this study.

*Research sample:* Online survey results show that there are 230 respondents, of which 230 are valid. Therefore, the study used 230 observations as the formal sample for this study.

## RESEARCH RESULTS

### Sample characteristics

The official research sample is 230 observations, the survey subjects are the board of directors of start-up enterprises in Vietnam. In the sample, in terms of type of business, the number of private enterprises is 67 startups (accounting for 29%), the number of limited liability companies is 58 startups (accounting for 25%), the number of joint-stock companies is 71 startups, accounting for 31% and the remaining 34 startups (accounting for 15%) are other types. In terms of field of operation, startups mainly operate in the commercial sector with the number of 97 startups (accounting for 42%), the manufacturing sector with 81 startups (accounting for 35%) and the service sector has 52 enterprises (accounting for 29%). In terms of labor size, start-up enterprises with less than 10 employees are 15 startups (accounting for 7%), from 11 to 30 employees are 65 startups (accounting for 28%), from 31 to 50 employees are 105 startups (accounting for 46%) and over 51 employees with 45 startups (accounting for 20%). Regarding the information of survey respondents, 112 people are male (accounting for 49%), the rest 118 people are female, accounting for 51%. The number of surveyed people with high school or college education is 82 people (accounting for 36%), university education is 117 people (accounting for 51%) and postgraduate is 31 people (accounting for 13%) (see Table 2).

**Table 2**  
*Research 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: Processing results from the author's survey data.

### Scale evaluation

Table 3 presents the Cronbach's alpha reliability test, composite reliability (CR), average variance extracted (AVE) of the scales in the model. The scales all have Cronbach's Alpha coefficient ( $\alpha$ ) and composite reliability higher than the minimum allowed threshold.  $\alpha_{AR} = 0.721$ ;  $\alpha_{DT} = 0.839$ ;  $\alpha_{HC} = 0.854$ ;  $\alpha_{SC} = 0.854$  are higher than 0.6 and  $CR_{AR} = 0.842$ ;  $CR_{DT} = 0.903$ ;  $CR_{HC} = 0.893$ ;  $CR_{SC} = 0.901$  are higher than 0.7 [52]. Average variance extracted (AVE) of the scales:  $AVE_{AR} = 0.640$ ;  $AVE_{DT} = 0.755$ ;  $AVE_{HC} = 0.585$ ;  $AVE_{SC} = 0.695$  are higher than 0.5. Therefore, the scales in

the research model are reliable according to the standards of Hair Jr, et al. [52].

**Table 3**  
*Scale evaluation*

| Scale                  | Cronbach's Alpha | Composite reliability | Average variance extracted |
|------------------------|------------------|-----------------------|----------------------------|
| Access to Resources    | 0.721            | 0.842                 | 0.640                      |
| Digital Transformation | 0.839            | 0.903                 | 0.755                      |
| Human Capital          | 0.854            | 0.893                 | 0.585                      |
| Social Capital         | 0.854            | 0.901                 | 0.695                      |

Source: processing results from the author's survey data.

The results of Table 4 show that the loading factors of all observed variables are larger than 0.7, except for the observed variable "We always improve our creative and intellectual capacity in digital technology" which has a loading factor of 0.575 < 0.7.

**Table 4**  
*Statistical indicators of the scales*

| Observed variables  | Mean  | SD    | Outer loadings |
|---|-------|-------|----------------|
| I have received financial support from start-up support organizations to invest in digital platforms (AR1)  | 2.578 | 0.845 | 0.845          |
| I have received relevant information/knowledge about digital transformation from start-up support organizations (AR2)   | 2.617 | 0.919 | 0.819          |
| I have been introduced to business partners providing digital services (AR3)  | 2.678 | 0.992 | 0.732          |
| 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          |
| We have built close relationships with buyers (SC1)   | 3.678 | 1.026 | 0.834          |
| We have built close relationships with digital service providers (SC2)  | 3.683 | 0.932 | 0.824          |
| We have built close relationships with our competitors (SC3)  | 3.548 | 0.985 | 0.835          |
| We have built close relationships with levels of Government agencies (SC4)  | 3.470 | 0.917 | 0.841          |
| 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          |

Note: AR: Access to resources, DT: Digital Transformation, SC: Social capital, HC: Human Capital.

Source: processing results from the author's survey data.

However, this observed variable is still retained because it has important content value in this scale. Therefore, the observed variables used in the research model have reached convergent validity according to the standard of Hair Jr, et al. [52].

In summary, according to the evaluation criteria of Hair Jr, et al. [52] on Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) of the model, the scales ensure reliability and convergent validity as well as meet the allowable requirements to take the next steps. Table 5 presents the results of evaluating the discriminant validity of latent variables in the model, using Fornell - Lacker criteria according to Fornell and Larcker [53]. Table 5 shows that all square root values of AVE of each research variable are greater than the correlation coefficient between that variable and the rest of the variables in the model. Therefore, the scales of the research variables all have reached discriminant validity.

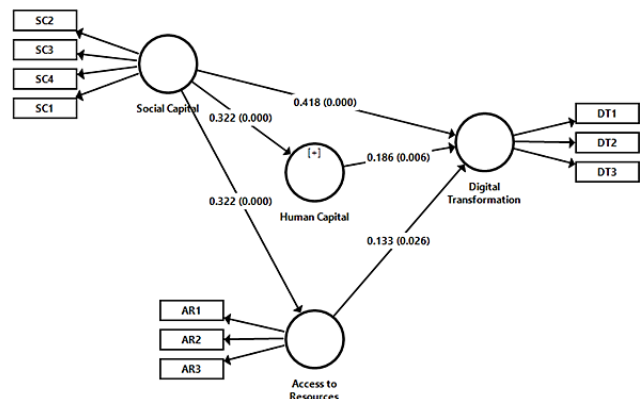
**Table 5**  
*Discriminant validity testing (Fornell-Lacker)*

| Constructs                | Mean  | SD    | 1     | 2     | 3     | 4     |
|---------------------------|-------|-------|-------|-------|-------|-------|
| 1. Access to Resources    | 2.624 | 0.919 | 0.800 |       |       |       |
| 2. Digital Transformation | 3.501 | 0.983 | 0.339 | 0.869 |       |       |
| 3. Human Capital          | 3.709 | 1.039 | 0.380 | 0.372 | 0.765 |       |
| 4. Social Capital         | 3.595 | 0.965 | 0.322 | 0.521 | 0.322 | 0.834 |

Source: processing results from the author's survey data.

**Estimated results and discussion**

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



**Fig. 2** Estimated results of PLS-SEM

Table 6 presents the test results of the theoretical model. The quality of the proposed model is evaluated through R<sup>2</sup> and Stone-Geisser index values (Q<sup>2</sup>). Table 6 shows that the R<sup>2</sup> value DT is 0.324 > 0.26. According to the evaluation criteria of Cohen [54], it is considered strong. Stone-Geisser index values of Q<sup>2</sup><sub>DT</sub> is 0.241 in the range (0.02; 0.35), according to the standard of Chin [55], the predictive level of the model is moderate. In addition, the effect size (f<sup>2</sup>) between the components is > 0.02 but < 0.35. According to Henseler, et al. [56], the level of effect between components is moderate.

**Table 6**  
**Hypothesis testing results**

| Hypothesis                        | Relation | $\beta$   | Bootstrapping | SD    | T     | Bootstrapping confidence intervals | P-value | VIF   | Conclusion |
|-----------------------------------|----------|---|---------------|-------|-------|------------------------------------|---------|-------|------------|
| Direct impact                     |          |   |               |       |       |                                    |         |       |            |
| H <sub>1</sub>                    | SC → DT  | 0.418   | 0.417***      | 0.07  | 5.971 | [0.273; 0.552]                     | 0.000   | 1.177 | Accepted   |
| H <sub>2</sub>                    | SC → HC  | 0.322   | 0.331***      | 0.064 | 5.032 | [0.196; 0.449]                     | 0.000   | 1.000 | Accepted   |
| H <sub>3</sub>                    | HC → DT  | 0.186   | 0.189***      | 0.069 | 2.72  | [0.050; 0.320]                     | 0.007   | 1.232 | Accepted   |
|                                   | SC → AR  | 0.322   | 0.33***       | 0.058 | 5.517 | [0.211; 0.438]                     | 0.000   | 1.000 |            |
|                                   | AR → DT  | 0.133   | 0.136**       | 0.059 | 2.269 | [0.020; 0.251]                     | 0.023   | 1.232 |            |
| Indirect impact                   |          |   |               |       |       |                                    |         |       |            |
| H <sub>4</sub>                    | SC→AR→DT | 0.043   | 0.045**       | 0.021 | 2.039 | [0.007; 0.090]                     | 0.042   |       | Accepted   |
| H <sub>5</sub>                    | SC→HC→DT | 0.06  | 0.062*        | 0.025 | 2.383 | [0.017; 0.115]                     | 0.017   |       | Accepted   |
| R <sup>2</sup> <sub>DT(Adj)</sub> |          | 0.324   |               |       |       |                                    |         |       |            |
| f <sup>2</sup>                    |          | f <sup>2</sup> <sub>AR→DT</sub> = 0.022; f <sup>2</sup> <sub>HC→DT</sub> = 0.042; f <sup>2</sup> <sub>SC→AR</sub> = 0.116; f <sup>2</sup> <sub>SC→DT</sub> = 0.223; f <sup>2</sup> <sub>SC→HC</sub> = 0.116 |               |       |       |                                    |         |       |            |
| Stone-Geisser's Q <sup>2</sup>    |          | Q <sup>2</sup> <sub>AR</sub> = 0.063; Q <sup>2</sup> <sub>DT</sub> = 0.241; Q <sup>2</sup> <sub>HC</sub> = 0.057  |               |       |       |                                    |         |       |            |

Note: \*\*\*, \*\*, \* correspond to the significance level of 1%, 5%, và 10%, respectively.

Source: processing results from the author's survey data.

The results show that all relationships are statistically significant, so all proposed hypotheses in the research model are accepted. The test results show that manager's social capital has a positive relationship with digital transformation of startups, so the hypothesis H<sub>1</sub> is accepted (H<sub>1</sub>: B = 0.417; p = 0.000 < 0.01). Similarly, the test results show that social capital has a positive relationship with human capital, so the hypothesis H<sub>2</sub> is also accepted (H<sub>2</sub>: B = 0.331, p = 0.000 < 0.01). Next, human capital also contributes to promote digital transformation of startups (H<sub>3</sub>: B = 0.189, p = 0.007 < 0.01), therefore the hypothesis H<sub>3</sub> is also accepted.

The results of Bootstrapping with N = 5000 observations show that the points of estimator of relationships with intermediate effects is statistically significant. For the hypothesis H<sub>4</sub>, the point of estimator (H<sub>4</sub>: B = 0.045, p = 0.042 < 0.05) is in the confidence interval and there is no 0 value in this confidence interval (95%, CIs = 0.007; 0.090), so hypothesis H<sub>4</sub> is accepted. The test results show that there is an indirect influence of social capital on digital transformation through the mediating role of resource access. According to the standards of Hair Jr, et al. [52], access to resources acts as an intermediary between social capital and digital transformation. For the hypothesis H<sub>5</sub>, the test results show that the point of estimate of relationships with intermediate effects (H<sub>5</sub>: B = 0.062, p = 0.017 < 0.05) belongs to the 95% confidence interval (CIs: 0.017; 0.115) and has statistically significant. Furthermore, the confidence interval CIs (0.017; 0.115) does not include the value 0. Therefore, hypothesis H<sub>5</sub> is accepted, social capital has an indirect effect on digital transformation according to the criteria of Hair Jr, et al. [52].

Table 7 shows the direct and indirect effects of social capital on digital transformation through the mediated mechanism of access to resources and human capital. The direct impact of social capital on digital transformation is B<sub>direct</sub> = 0.417, the level of indirect impact is B<sub>indirect</sub> = 0.106 and the total impact of social capital on digital transformation is B<sub>total</sub> = 0.523. The results show that the partial mediating roles of access to resources and human

capital contributes to the digital transformation of startups.

**Table 7**  
**Direct and indirect effects on digital transformation**

| Factors             | Effect   | Human capital | Access to resources | Digital transformation |
|---------------------|----------|---------------|---------------------|------------------------|
| Social capital      | Direct   | 0.328         | 0.328               | 0.417                  |
|                     | Indirect | 0.000         | 0.000               | 0.106                  |
|                     | Total    | 0.328         | 0.328               | 0.523                  |
| Human capital       | Direct   |               |                     | 0.190                  |
|                     | Indirect |               |                     | 0.000                  |
|                     | Total    |               |                     | 0.190                  |
| Access to resources | Direct   |               |                     | 0.135                  |
|                     | Indirect |               |                     | 0.000                  |
|                     | Total    |               |                     | 0.135                  |

Source: Processing results from the author's survey data.

Previous studies have suggested that access to resources is mainly from social networks [33], network size and relationship quality [34]. Managers' human capital also helps businesses access external support resources [6]. In this study, access to external support resources through managers' social capital supports startups in digital transformation in order to become suitable for the market context during the outbreak of the COVID-19 epidemic. During the crisis period under the negative impact of the COVID-19 epidemic, startups need to change their business strategies, in which digital transformation is the optimal solution for startups to access markets and customers, when direct communication with customers and partners is limited. However, digital transformation in enterprises is not easy to implement with limited resources and capacities of startups. Meanwhile, managers' social capital plays an important role in supporting digital transformation. Social capital helps startups easily access external support resources. According to project 844/QD-TTg, start-up businesses are eligible for various supports from different sources. Moreover, during the COVID-19 pandemic, startups are one of the main objects of support due to the impact of the epidemic. However, access to these support resources

is still limited. Therefore, social capital plays an important role in accessing support resources to promote digital transformation.

In addition to digital transformation, startups need financial resources to invest in digital platforms. However, the human capital of managers and workers makes an important contribution to digital transformation. Some previous studies have suggested that digital transformation relies on information technology capabilities [5] and digital transformation thanks to managers' social capital [1]. In this study, digital transformation relies on digital skills and capabilities of managers and employees. Managers must raise awareness of digital transformation, self-development, digital management skills, create a digital culture environment for businesses, and develop digital capabilities for adaptive capacity and mobility. Finally, creativity and intelligence play an important role in the digital transformation of startups.

## CONCLUSION

The study applied the theory of social capital to explain the access to external resources to promote digital transformation of startups. Through social capital, startups can access external support resources and increase human capital, making an important contribution to digital transformation during the outbreak of the COVID-19 epidemic. The research results show that the hypotheses proposed in the theoretical model are accepted with test results in the transitional market of Vietnam. This study offers theoretical and practical contributions.

### *For theoretical aspect:*

Firstly, the study examined the relationship between social capital, human capital, access to resources and digital transformation of startups in a transitional economy like Vietnam. The above relationships are accepted and statistically significant. Research results are evidence to answer the statement of Li, et al. [1], digital transformation thanks to the development of social capital of managers when small and medium enterprises have limited resources and capacity. The characteristics of start-up businesses in the early stages are having limited operational resources and capacity, building a network of relationships with stakeholders is a development strategy and suitable for a developing economy [40, 42]. Benefiting from social capital, startups can easily access support resources to build a digital platform for businesses. In addition, the human capital requirement in the digital transformation of the economy has also improved [31]. Access to external support resources and human capital are two important factors that help startups transform digitally.

Second, the research has discovered the mediating role of access to resources between social capital and digital transformation while previous studies have not mentioned. Access to resources acts as an intermediary to accelerate the digital transformation of startups ( $B_{\text{indirect}} = 0.045$ ).

Finally, the test results of the study uncover the mediating role of human capital between social capital and digital transformation. Human capital contributes to the digital transformation of startups ( $B_{\text{indirect}} = 0.045$ ).

### *For practical aspect:*

The research results have proposed practical implications for startups and agencies. For startups, it is necessary to understand the role of networking in accessing support resources for digital transformation. Startups need to build a strong network of relationships with stakeholders such as Government, customers, competitors and digital suppliers. Thanks to this network of connections, managers' social capital is expanded, promoting easier access to supporting resources. In some digital transformation training programs of the Government, businesses 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 conduct testing. Based on the platform equipped with information and resources from external support organizations, businesses need to develop digital infrastructure such as IoT, 5G networks, electronic payment systems, etc. Businesses also need to evaluate and cooperate in research, development and innovation 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.

The survey sample in the study is enterprises 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 engineering, high technology, and information technology are those would require stronger digital transformation than other industries. Therefore, further studies need to re-test the above relationship for a specific industry.

Human capital theory has explained the formation of external support resources [6]. The theory of social capital is used in the research to explain the formation of external resources to easily access external support resources and improve human capital to promote digital transformation. In addition, businesses need human resources with information technology capabilities to promote digital transformation [4]. Digital transformation is the optimal solution to help businesses innovate their business models to suit the context of the crisis caused by the COVID-19 epidemic. Therefore, in further studies, it is necessary to evaluate the impact of digital transformation on business model innovation and business performance of startups in developing economies.



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**REFERENCES**

- [1] L. Li, F. Su, W. Zhang, and J.-Y. Mao, "Digital transformation by SME entrepreneurs: A capability perspective", vol. 28, no. 6, pp. 1129-1157, 2018.
- [2] H. Bouwman, S. Nikou, and M. de Reuver, "Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs?", *Telecommunications Policy*, vol. 43, no. 9, pp. 101-828, 2019.
- [3] N. Sinno, "The Effect of Digital Transformation on Innovation and Entrepreneurship in the Tourism Sector: The Case of Lebanese Tourism Services Providers", in *Digital Economy. Emerging Technologies and Business Innovation*, Cham, 2019, pp. 29-39: Springer International Publishing.
- [4] J.K. Nwankpa and Y. Roumani, "IT capability and digital transformation: A firm performance perspective", presented at the Thirty Seventh International Conference on Information Systems, Dublin, 2016.
- [5] S. Nambisan, M. Wright, and M. Feldman, "The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes", *Research Policy*, vol. 48, no. 8, pp. 103-773, 2019.
- [6] T. Ghi, N.T.P. Anh, N.Q. Thu, and N.Q. Huan, "Entrepreneur's Human Capital and Business Model Innovation: The Mediation Role of Access to Start-Up Resources", (in 英文), *International Journal of Information and Management Sciences*, vol. 32, no. 1, pp. 59-76, 2021.
- [7] E. Santarelli and H. T. Tran, "The interplay of human and social capital in shaping entrepreneurial performance: the case of Vietnam", *Small Business Economics*, vol. 40, no. 2, pp. 435-458, 2013/02/01 2013.
- [8] E. Prem, "A digital transformation business model for innovation", in ISPIIM Innovation Symposium, 2015, p. 1: The International Society for Professional Innovation Management (ISPIIM).
- [9] X. Xie, Y. Han, A. Anderson, and S. Ribeiro-Navarrete, "Digital platforms and SMEs' business model innovation: Exploring the mediating mechanisms of capability reconfiguration", *International Journal of Information Management*, vol. 65, p. 102513, 2022/08/01/2022.
- [10] S. J. Berman, "Digital transformation: opportunities to create new business models", *Strategy & Leadership*, vol. 40, no. 2, pp. 16-24, 2012.
- [11] A. Priyono, A. Moin, and V. N. A. O. Putri, "Identifying Digital Transformation Paths in the Business Model of SMEs during the COVID-19 Pandemic", *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 6, no. 4, p. 104, 2020.
- [12] M. Granovetter, "Economic action and social structure: The problem of embeddedness", *American Journal of Sociology*, vol. 91, no. 3, pp. 481-510, 1985.
- [13] W.W. Powell, B. Staw, and L. Smith-Doerr, *Networks and economic life. The handbook of economic sociology*, 2005, p. 380.
- [14] R.S. Burt, *Structural holes*. Harvard University Press, 1992.
- [15] C. Jones, W. S. Hesterly, and S.P. Borgatti, "A general theory of network governance: Exchange conditions and social mechanisms", *Academy of management review*, vol. 22, no. 4, pp. 911-945, 1997.
- [16] N.M. Tichy, M.L. Tushman, and C. Fombrun, "Social network analysis for organizations", *Academy of Management Review*, vol. 4, no. 4, pp. 507-519, 1979.
- [17] N. Lin, *Social capital: A theory of social structure and action* (no. 19). Cambridge University Press, 2002.
- [18] J. Nahapiet and S. Ghoshal, "Social Capital, Intellectual Capital, and the Organizational Advantage", vol. 23, no. 2, pp. 242-266, 1998.
- [19] I. Serageldin and P. Dasgupta, *Social capital: a multifaceted perspective*. The World Bank, 2001.
- [20] M. Dakhli and D. De Clercq, "Human capital, social capital, and innovation: a multi-country study", *Entrepreneurship & Regional Development*, vol. 16, no. 2, pp. 107-128, 2004.
- [21] J.S. Coleman, *Foundations of social theory*. Harvard University Press, 1994.
- [22] J.M. Unger, A. Rauch, M. Frese, and N. Rosenbusch, "Human capital and entrepreneurial success: A meta-analytical review", *Journal of Business Venturing*, vol. 26, no. 3, pp. 341-358, 2011.
- [23] M. R. Marvel, "Human Capital and Search-Based Discovery: A Study of High-Tech Entrepreneurship", *Entrepreneurship Theory and Practice*, vol. 37, no. 2, pp. 403-419, 2013.
- [24] D. Dimov, "Nascent Entrepreneurs and Venture Emergence: Opportunity Confidence, Human Capital, and Early Planning", vol. 47, no. 6, pp. 1123-1153, 2010.
- [25] S.W. Bradley, J.S. McMullen, K. Artz, and E. M. Simiyu, "Capital is not enough: Innovation in developing economies", *Journal of Management Studies*, vol. 49, no. 4, pp. 684-717, 2012.
- [26] J. Florin and W. Schultze, "Social capital and fundability of high potential new ventures, presented at the academy of Management Meetings", presented at the Toronto, August, 2000.
- [27] J.M. Pennings, K. Lee, and A.V. Witteloostuijn, "Human Capital, Social Capital, and Firm Dissolution", vol. 41, no. 4, pp. 425-440, 1998.
- [28] T. Hinz and M. Jungbauer-Gans, "Starting a business after unemployment: characteristics and chances of success (empirical evidence from a regional German labour market)", *Entrepreneurship & Regional Development*, vol. 11, no. 4, pp. 317-333, 1999.
- [29] M. Kilkeny, L. Nalbarte, and T. Besser, "Reciprocated community support and small town – small business success", *Entrepreneurship & Regional Development*, vol. 11, no. 3, pp. 231-246, 1999.
- [30] S.J. Prais, *Productivity, Education and Training: Facts and Policies in International Perspective*. Cambridge University Press, 1995.
- [31] V. Rodchenko, G. Rekun, L. Fedoryshyna, I. Roshchin, S.J.J.o.E.E. Gazarian, and C.A. Research, "The effectiveness of human capital in the context of the digital transformation of the economy: The case of Ukraine", vol. 8, no. 2, pp. 202-213, 2021.
- [32] J. Barney, "Firm resources and sustained competitive advantage", *Journal of Management*, vol. 17, no. 1, pp. 99-120, 1991.
- [33] W. Ju, X. Zhou, and S. Wang, "The impact of scholars' guanxi networks on entrepreneurial performance – The mediating effect of resource acquisition", *Physica A: Statistical Mechanics and its Applications*, vol. 521, pp. 9-17, 2019.
- [34] T. Semrau and A. Werner, "How Exactly Do Network Relationships Pay Off? The Effects of Network Size and Relationship Quality on Access to Start-Up Resources",

- Entrepreneurship Theory and Practice*, vol. 38, no. 3, pp. 501-525, 2014.
- [35] M. Pagani, "Digital Business Strategy and Value Creation: Framing the Dynamic Cycle of Control Points", *MIS Quarterly*, vol. 37, no. 2, pp. 617-632, 2013.
- [36] B. Libert, M. Beck, and Y. Wind, "Questions to ask before your next digital transformation", *Harvard Business Review*, vol. 60, no. 12, pp. 11-13, 2016.
- [37] P. Weill and S. Aral, "IT Assets, Organizational Capabilities, and Firm Performance: How Resource Allocations and Organizational Differences Explain Performance Variation", *Organization Science*, vol. 18, pp. 763-780, 2007.
- [38] G. Westerman, D. Bonnet, and A. McAfee, *Leading digital: Turning technology into business transformation*. Harvard Business Press, 2014.
- [39] W.W. Powell, B. Staw, and L. Cummings, *Research in organizational behavior: Neither market nor hierarchy: Network forms of organizations*. Sage 1990.
- [40] M. W. Peng and Y. Luo, "Managerial ties and firm performance in a transition economy: The nature of a micro-macro link", *Academy of management journal*, vol. 43, no. 3, pp. 486-501, 2000.
- [41] E.W. Tsang, "In search of legitimacy: The private entrepreneur in China", *Entrepreneurship Theory and Practice*, vol. 21, no. 1, pp. 21-30, 1996.
- [42] T.V. Nguyen, M. Weinstein, and A.D. Meyer, "Development of trust: A study of interfirm relationships in Vietnam", *Asia Pacific Journal of Management*, vol. 22, no. 3, pp. 211-235, 2005.
- [43] P. Adler, "Social capital: Prospects for a new concept", *The Academy of Management Review*, vol. 27, no. 1, pp. 17-40, 2002.
- [44] H. Hoang and B. Antoncic, "Network-based research in entrepreneurship: A critical review", *Journal of Business Venturing*, vol. 18, no. 2, pp. 165-187, 2003.
- [45] S. Mithas, A. Tafti, and W. Mitchell, "How a Firm's Competitive Environment and Digital Strategic Posture Influence Digital Business Strategy", *MIS Quarterly*, vol. 37, no. 2, pp. 511-536, 2013.
- [46] N. Galante, C. Moret, and R. Said, "*Building capabilities in digital marketing and sales: Imperatives for consumer companies*", McKinsey & Company, 2013.
- [47] N.T. Le, S. Venkatesh, and T.V. Nguyen, "Getting bank financing: A study of Vietnamese private firms", *Asia Pacific Journal of Management*, vol. 23, no. 2, pp. 209-227, 2006.
- [48] R. Gustafsson and E. Autio, "A failure trichotomy in knowledge exploration and exploitation", *Research Policy*, vol. 40, no. 6, pp. 819-831, 2011/07/01/ 2011.
- [49] T.N. Ghi, N.Q. Thu, N.Q. Huan, and N.T. Trung, "Human capital, digital transformation, and firm performance of startups in Vietnam", *Management*, vol. 26, no. 1, pp. 1-18, 2022.
- [50] N.T. Le and T.V. Nguyen, "The impact of networking on bank financing: The case of small and medium-sized enterprises in Vietnam", *Entrepreneurship theory and practice*, vol. 33, no. 4, pp. 867-887, 2009.
- [51] J.F. Hair, G. T. M. Hult, C. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications, 2016.
- [52] J. F. Hair Jr, W.C. Black, B.J. Babin, and R. Anderson, *Multivariate Data Analysis London*: Cengage Learning, 2019.
- [53] C. Fornell and D. F. Larcker, "Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics", *Journal of Marketing Research*, vol. 18, no. 3, pp. 382-388, 1981.
- [54] J. Cohen, *Statistical power analysis for the behavioral sciences*. Academic Press, 2013.
- [55] W.W. Chin, "How to Write Up and Report PLS Analyses", in *Handbook of Partial Least Squares: Concepts, Methods and Applications*, V. Esposito Vinzi, W.W. Chin, J. Henseler, and H. Wang, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2010, pp. 655-690.
- [56] J. Henseler, C.M. Ringle, and R.R. Sinkovics, "The use of partial least squares path modeling in international marketing", in *New Challenges to International Marketing*, vol. 20, R.R. Sinkovics and P.N. Ghauri, Eds. (Advances in International Marketing: Emerald Group Publishing Limited, 2009, pp. 277-319.

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