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# DEVELOPING DIGITAL HUMAN RESOURCES, DIGITAL GOVERNMENT IN VIETNAM

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## ABSTRACT

*Developing digital government is becoming a trend in state governance in many countries. It's a process of transforming the state's operational model based on data and digital technology to automate processes, provide public services, and thereby operate more transparently, efficiently, and optimize resources. State administration is conducted in a digital environment, shifting from the physical to the digital. The development of digital government inevitably demands digital human resources, including civil servants - the workforce directly performing state administration tasks - and citizens - the workforce participating in state administration, now known as digital civil servants and digital citizens. Therefore, developing digital civil servants and digital citizens is a prerequisite for achieving the goal of developing digital government. This study constructs a theoretical framework to analyze the impact of developing digital civil servants and digital citizens on the goal of developing digital government. The author conducted a survey with a sample size of N = 250 local leaders at the commune level in three provinces across three regions of Vietnam: Phu Tho province (Northern Vietnam), Quang Tri province (Central Vietnam), and Dong Nai province (Southern Vietnam). The survey aimed to collect objective information and analyze the practical development of digital human resources and digital government in Vietnam in the current context. The survey results contribute to demonstrating that the development of digital civil servants and digital citizens is being implemented towards the goal of developing a digital government. Currently, the development of digital civil servants is rated at a higher level, but civil servants still need to improve their digital capabilities to cope with the rapid changes in digital technology and society; the development of digital citizens is rated at a lower level, requiring appropriate solutions to enhance the digital capabilities of citizens to meet the goals of developing a digital government.*

**KEYWORDS:** Digital human resources; Digital civil servants; Digital citizens; Digital government; Vietnam.

## 1. INTRODUCTION

2016 marked the first appearance of the Fourth Industrial Revolution (Industry 4.0), but it has rapidly developed and spread as a technological revolution and smart manufacturing revolution. According to assessments by Phuong, L.Q. (2017) and MIC (2021), Industry 4.0 changes the way people interact, work, and live, because digital technology is now applied in social activities, in the management and operation of organizations, creating breakthroughs in production, social activities, and state governance.

Recognizing the opportunities for development, Vietnam has proactively participated in the 4.0 revolution, adapted to digital technology, and developed a digital government, making it a key strategy for Vietnam to achieve breakthroughs in socio-economic development and improve the quality of life for its people (CPV, 2019). In terms of state governance, the development of digital government, digital economy, and digital society are the main pillars affirmed in the National Digital Transformation Program (PM, 2020). This reflects a shift in the mindset of state governance with the development of digital government and the application of digital technology to build a modern, professional, and efficient administration aimed at serving the people and promoting socio-economic development.

Actively participating in the Fourth Industrial Revolution is both a fundamental and urgent requirement to overcome the risk of falling further behind and to promote the rapid and sustainable development of the Vietnamese economy (Hoa, H.N., 2020). With this spirit, Vietnam has initially succeeded and is on the list of countries that adapt quickly to technology, achieving positive results in the development of digital government. However, the lack of precedent in developing digital government also poses significant challenges in state governance, directly related to the issue of digital human resources – digital civil servants, digital citizens. This is an issue that attracts the attention of many managers and researchers and is also the topic chosen by the author in this study.

## 2. LITERATURE REVIEW

Digital government is characterized by a model of government operating in a digital environment, shifting from a physical to a digital environment. MIC (2021) explains digital government from the perspective of applying information technology in state governance to make policy decisions and provide high-quality public services, better serving

the people. Similarly, Toan, N.Q. et al. (2022) affirm that digital government is a way for the government to organize and operate effectively in the digital world, through the application of information technology in state administration. Luca, T. et al. (2021) also expresses a similar view and emphasizes the requirement that the activities of government agencies be carried out securely in the digital environment, including the official duties of civil servants, citizen requests, and online public services. From another perspective, Que, N.D. et al. (2022) and Diep, T.N. et al. (2026) affirms that digital government is designed and operated based on the application of digital technology and digital data; helping state agencies achieve breakthrough changes and development in governance and administration through optimal use of resources and better service provision; at the same time, in the context of global digital transformation, digital government has become an inevitable trend to improve governance efficiency, transparency and quality of public services.

In that sense, developing digital government is understood as the process of transforming the state's operational model based on data and digital technology to automate processes, provide public services, thereby ensuring transparency, efficiency, and resource optimization. State governance is conducted in a digital environment, shifting from the physical to the digital environment. At different levels of approach, the studies have interpreted the scale "Developing Digital Government" (DGV) with the following main contents: The government model is designed to be streamlined, transitioning from a physical to a digital environment, and operating securely in the digital environment (DGV1); Government operations are conducted securely in the digital environment, with public, accurate, and online data (DGV2); Public service activities of civil servants, citizen requests, and public services are carried out conveniently based on the exploitation of digital and online data (DGV3).

The common challenge of developing digital government is to ensure the effectiveness and efficiency of state governance and better serve the people. The development of digital government inevitably requires human resources, including civil servants – the workforce directly performing state administration tasks – and citizens – the workforce participating in state administration, now known as digital civil servants and digital citizens. Because when digital technology is applied in the administration and operation of government agencies, but the participating entities have limited

digital capabilities, the goal of developing digital government is difficult to achieve. Therefore, developing digital civil servants and digital citizens is a condition for achieving the goal of developing digital government. With that in mind, this study builds a theoretical framework and analyzes the practical development of digital government, digital civil servants, and digital citizens in Vietnam with the hypothesis: Developing digital civil servants (H1) and Developing digital citizens (H2) directly affect the goal of Developing digital government [Figure 1].

- Firstly, civil servants play a direct role in carrying out state governance tasks in the context of digital government, so developing digital civil servants is a fundamental and primary requirement. According to Son, V.T. et al. (2021), civil servants are the subjects performing public duties, and in the context of developing digital government, they need to be trained to become digital civil servants with the ability to advise and implement work in a digital environment. Hoa, L.Q. et al. (2023) affirm that developing digital civil servants is both a priority and a regular solution to equip and update digital skills to achieve the goal of digital government. From another perspective, Bau, D.N. (2025) argues that the solution for developing digital civil servants depends mainly on the proactive learning of civil servants: In addition to being trained in digital capabilities, each civil servant needs to proactively learn to update and supplement their digital knowledge and skills, and there needs to be incentive policies from state agencies. Researchers generally agree that when civil servants possess digital competence, they demonstrate confidence in handling tasks, conducting transactions, and guiding citizens through administrative procedures in the digital environment, thus achieving the goal of developing a digital government. With fairly similar viewpoints, these studies have broadly interpreted the scale "Developing Digital Civil Servants" (DCS), highlighting several key aspects: Civil servants are trained and equipped with updated digital skills to develop digital capabilities to meet the requirements of the digital government objectives (DCS1); Government agencies have policies to encourage civil servants to proactively train and equip themselves with updated digital skills to develop digital capabilities to meet the requirements of the digital government

objectives (DCS2); Civil servants are capable of advising, implementing work, and conducting transactions and guiding citizens through administrative procedures in the digital environment (DCS3).

- Secondly, citizens are legally empowered to participate in state governance, demonstrating their role as subjects in state administration. In the context of developing digital government, citizens conduct transactions and request the resolution of administrative documents online. According to Thang, C. (2024), digital government is a new and groundbreaking issue in local social development governance, but it also requires the development of digital capabilities so that each citizen becomes a digital citizen, capable of conducting transactions and requesting the resolution of documents in the digital environment. Similarly, Nguyen, T. (2025) and Huong, D.T.T. (2025) affirm that when citizens have digital capabilities, they will become digital citizens and exercise their right to provide feedback and critique policies in the digital environment. The important issue in state governance at this time is the need to implement measures to promote digital transformation and digital government; organize training and encourage the development of digital capabilities for citizens. In that sense, the studies above generally interpret the scale "Developing Digital Citizens" (DCZ), highlighting several key points: Citizens are informed about digital government and participate as social actors in achieving national digital transformation goals (DCZ1); Citizens are trained and encouraged to develop digital skills to participate in digital social activities and achieve national digital transformation goals (DCZ2); Citizens have digital skills and conduct transactions, request administrative processing, and participate in policy-making processes in the digital environment (DCZ3).

Thus, developing digital government is a new issue with no precedent, and recent studies have emphasized the significance of developing digital human resources for the development of digital government. Building upon and developing these contents, this study constructs a theoretical framework consisting of two scales/independent variables: "Developing digital civil servants" (DCS), "Developing digital citizens" (DCZ), and one scale/independent variable: "Developing digital

government” (DGV). The scales consist of nine observed variables, designed by the author as nine questions in a survey questionnaire and measured

using a 5-point Likert scale: 1 - Strongly disagree; 2 - Disagree; 3 - Neutral; 4 - Agree; 5 - Strongly agree (Table 1).

Table 1. Theoretical framework.

No	Scales	Encode	Rating levels				
			1	2	3	4	5
<b>I</b>	<b>Developing digital civil servants</b>	<b>DCS</b>					
1	Civil servants are trained and equipped with updated digital skills to develop digital capabilities to meet the requirements of the digital government objectives	DCS1					
2	Government agencies have policies to encourage civil servants to proactively train and equip themselves with updated digital skills to develop digital capabilities to meet the requirements of the digital government objectives	DCS2					
3	Civil servants are capable of advising, implementing work, and conducting transactions and guiding citizens through administrative procedures in the digital environment	DCS3					
<b>II</b>	<b>Developing digital citizens</b>	<b>DCZ</b>					
4	Citizens are informed about digital government and participate as social actors in achieving national digital transformation goals	DCZ1					
5	Citizens are trained and encouraged to develop digital skills to participate in digital social activities and achieve national digital transformation goals	DCZ2					
6	Citizens have digital skills and conduct transactions, request administrative processing, and participate in policy-making processes in the digital environment	DCZ3					
<b>III</b>	<b>Developing digital government</b>	<b>DGV</b>					
7	The government model is designed to be streamlined, transitioning from a physical to a digital environment, and operating securely in the digital environment	DGV1					
8	Government operations are conducted securely in the digital environment, with public, accurate, and online data	DGV2					
9	Public service activities of civil servants, citizen requests, and public services are carried out conveniently based on the exploitation of digital and online data	DGV3					

Source: Compiled by the author through the review.

**Research model**

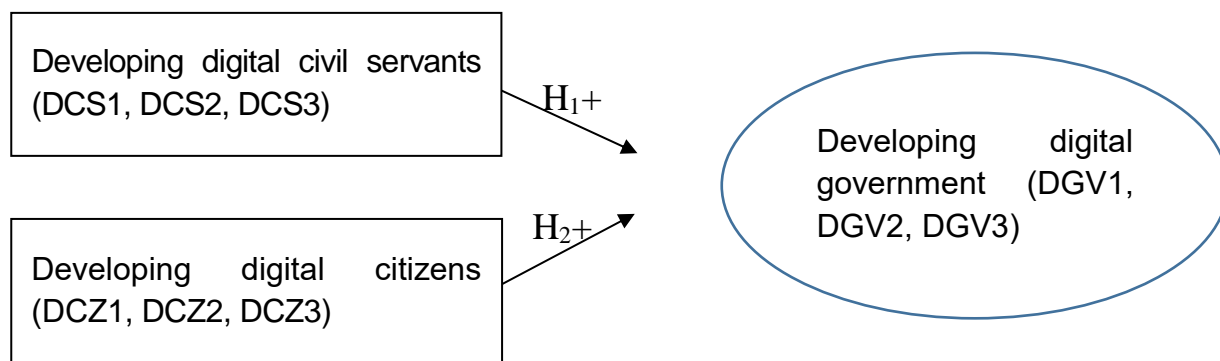


Figure 1. Research model.

**3. RESEARCH METHODS**

To achieve this research objective, the author uses a combination of qualitative and quantitative methods.

Qualitative methods were used through the process of collecting and analyzing secondary data to build a theoretical framework and model, including two independent scales/variables: “Developing digital civil servants” (DCS), “Developing digital citizens” (DCZ), and one dependent scale/variable:

“Developing digital government” (DGV).

Quantitative methods were used through a survey process to collect primary data for analysis and to draw conclusions in empirical research on developing digital government, digital civil servant development, and digital citizen development in Vietnam. Based on the survey sample size calculation formula of Hair, J.F. et al. (2009), the minimum sample size required for exploratory factor analysis is  $N = 5 \cdot m$  (m is the total number of observed

variables); applied in this study, it is  $N = 9 \times 5 = 45$ .

In fact, the author surveyed a sample size of  $N = 250$  ( $N > 45$ ) of local leaders at the commune level in 3 provinces across 3 regions of Vietnam: Phu Tho province (Northern), Quang Tri province (Central), and Dong Nai province (Southern). The author designed the survey questionnaire and conducted the survey based on the respondents' consent; the results showed that 250 out of 250 questionnaires were valid, achieving a 100% response rate.

#### 4. RESEARCH RESULTS AND DISCUSSION

*Table 2. Statistical results and testing results of the scale.*

Scales	Observed variables	N	Min	Max	Mean	Std. Deviation	Cronbach' Alpha	Corrected Item-Total Correlation
1. Developing digital civil servants (DCS)	DCS1	250	1	5	4.19	.712	.765	DCS1 = .602
	DCS2	250	1	5	4.20	.708		DCS2 = .586
	DCS3	250	1	5	4.17	.683		DCS3 = .593
2. Developing digital citizens (DCZ)	DCZ1	250	1	5	4.11	.693	.731	DCZ1 = .584
	DCZ2	250	1	5	4.05	.704		DCZ2 = .601
	DCZ3	250	1	5	3.99	.710		DCZ3 = .553
3. Developing digital government (DGV)	DGV1	250	1	5	4.13	.689	.759	DGV1 = .592
	DGV2	250	1	5	4.16	.706		DGV2 = .584
	DGV3	250	1	5	4.14	.697		DGV3 = .598
Valid N (listwise)		250						

*Source: Author's survey results*

Table 2 shows that the observations of the scales "Developing digital civil servants" (DCS), "Developing digital citizens" (DCZ), and "Developing digital government" (DGV) are all rated at a mean of  $\text{Mean} \geq 3.99$  and  $\text{Mean} \leq 4.20$ , which are statistically significant according to the Likert scale (1-5). The observed values obtained show that the survey responses of local leaders are concentrated, meaning that the scales and observed variables in the theoretical model have good structural validity and are built appropriately for the empirical study. Specifically:

- Firstly, the observed variables of the scale/dependent variable "Developing digital government" (DGV) have high average values: Mean (DGV1) = 4.13, Mean (DGV2) = 4.16, Mean (DGV3) = 4.14. This indicates that Vietnam has built a digital government model and operates safely in the digital environment; data is public, accurate, and online, facilitating the work of civil servants, the processing of citizen requests, and public services based on the exploitation of digital and online data.
- Secondly, along with building a digital government, Vietnam has implemented a policy of training digital human resources to meet the requirements of digital transformation and developing a digital

government, as shown below:  
 + The observed variables of the scale/independent variable "Developing digital civil servants" (DCS) have the highest average values: Mean (DCS1) = 4.11, Mean (DCS2) = 4.05, Mean (DCS3) = 3.99. This indicates that civil servants are trained/encouraged to receive training to equip and update their digital skills to develop digital capabilities and the ability to advise, implement work, and conduct transactions, guiding citizens through administrative procedures in the digital environment, meeting the requirements of the digital government objectives.  
 + The observed variables of the scale/independent variable "Developing digital citizens" (DCZ) have lower average values: Mean (DCZ1) = 4.02, Mean (DCZ2) = 4.04, and the lowest is Mean (DCZ3) = 3.98. This also contributes to showing that, although citizens have been informed about digital government, trained/encouraged to develop digital skills, and become social subjects in implementing national digital transformation goals, their digital skills are still limited; a significant percentage of citizens are still not proficient in conducting transactions/requesting administrative procedures in the digital environment; and the effectiveness of training to develop digital skills for citizens has not met expectations.

In the process of developing digital government, citizens are the main actors participating in state governance in the digital environment. When citizens possess digital literacy and are proficient in conducting transactions and handling administrative documents digitally, the digital governance of local governments will be effective, and the goal of developing a digital government will be achieved. Therefore, appropriate solutions are needed to develop citizens' digital literacy so that they become digital citizens and actively participate in achieving the goal of developing a digital government.

Table 2 shows the standard test values for all three scales and nine observed variables in the initial theoretical model, which were subsequently used for further analysis. The author conducted exploratory

factor analysis with Varimax rotation to preliminarily assess the unidimensionality, convergent validity, and discriminant validity of the scales and to test the fit of the theoretical model. The results of the exploratory factor analysis are shown in Tables 3 and 4 below.

**Table 3. Total Variance Explained.**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	4178.060
	df	36
	Sig.	.000

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.638	40.424	40.424	3.638	40.424	40.424	3.140	34.892	34.892
2	2.921	32.461	72.884	2.921	32.461	72.884	2.896	32.177	67.068
3	1.031	11.456	84.341	1.031	11.456	84.341	1.555	17.272	84.341
4	.477	5.301	89.641						
5	.420	4.662	94.303						
6	.162	1.803	96.106						
7	.143	1.586	97.692						
8	.108	1.199	98.891						
9	.100	1.109	100.000						

Extraction Method: Principal Component Analysis.

Source: Author's survey results.

**Table 4. Rotated Component Matrix**

Rotated Component Matrix <sup>a</sup>				
Scales	Observed variables	Component		
		1	2	3
1. Developing digital civil servants (DCS)	DCS1	.812		
	DCS2	.791		
	DCS3	.825		
2. Developing digital citizens (DCZ)	DCZ1		.794	
	DCZ2		.821	
	DCZ3		.814	
3. Developing digital government (DGV)	DGV1			.819
	DGV2			.804
	DGV3			.822

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 5 iterations.

Source: Author's survey results

The results of the exploratory factor analysis show: KMO = 0.722 > 0.5, confirming that

exploratory factor analysis is appropriate for the dataset; the Bartlett test has an observed significance level Sig. = 0.000 < 0.05, indicating that the observed variables have a linear correlation with the representative factor; Total Variance Explained with Cumulative % = 84.341 > 50%, showing that 84.341% of the variation of the representative factors is explained by the observed variables (Table 3). All observed variables have Factor Loading > 0.5 (Table 4), indicating that the observed variables are statistically significant.

Initial Eigenvalues stopped at 3 factors with Eigenvalues > 1 (Table 3), indicating that the observed variables were extracted into 3 factors corresponding to the 3 initial factors. Thus, the original theoretical model was retained, consisting of 2 independent scales/variables "Developing digital civil servants" (DCS), "Developing digital citizens" (DCZ) and 1 dependent scale/variable "Developing digital government" (DGV) with a total of 9 observed variables that are statistically significant and can be further analyzed. Based on this, the author conducted correlation analysis to examine the relationship of the scales in the theoretical model, as

a basis for drawing research conclusions (Table 5).

**Table 5. Correlation analysis results of the scales.**

		Correlations		
		DCS	DCZ	DGV
Developing digital civil servants (DCS)	Pearson Correlation	1	.187	.512**
	Sig. (2-tailed)		.000	.000
	N	250	250	250
Developing digital citizens (DCZ)	Pearson Correlation	.187	1	.483**
	Sig. (2-tailed)	.000		.000
	N	250	250	250
Developing digital government (DGV)	Pearson Correlation	.512**	.483**	1
	Sig. (2-tailed)	.000	.000	
	N	250	250	250

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source: Author's survey results**

The correlation analysis results in Table 5 show that the correlation coefficients of the scales reached values of  $0 < r < 1$ . This indicates a positive correlation between the two independent scales/variables "Developing digital civil servants" (DCS), "Developing digital citizens" (DCZ) and the one dependent scale/variable "Developing digital government" (DGV); and hypotheses H1 and H2 are accepted; the initial theoretical model fits the survey dataset. The  $r$  values [ $r$  (DCS) = .512 and  $r$  (DCZ) = .483] show that the correlation levels of the independent and dependent variables, in increasing order, are: "Developing digital citizens" (DCZ) and "Developing digital civil servants" (DCS).

Based on the results of the analysis and testing of the theoretical model, the empirical research conclusions on developing digital human resources and developing digital government in Vietnam are as follows:

1. Vietnam has built a digital government model and operates safely in the digital environment; information and data are public, accurate, and

online, facilitating the work of civil servants, the processing of citizen requests, and public services based on the exploitation of digital and online data.

2. Secondly, along with building a digital government, Vietnam has implemented a policy of training and developing digital human resources to meet the requirements of digital transformation and developing a digital government. Specifically:

- Civil servants are trained/encouraged to receive training to equip and update their digital skills to develop digital capabilities and the ability to advise, implement work, and conduct transactions, as well as guide citizens through administrative procedures in the digital environment, meeting the requirements of developing a digital government. However, civil servants still need to improve their digital capabilities in the face of rapid changes in digital technology and the digital society. Therefore, developing the digital capabilities of civil servants remains essential and a continuous effort in state administration.
- Citizens are informed about digital government, receive training/encouragement to develop digital skills, and become active participants in achieving national digital transformation goals. However, the digital skills of citizens remain limited; a significant percentage of people are still not proficient in conducting transactions/requesting administrative services in the digital environment; and the effectiveness of training to develop digital skills for citizens has not met expectations. Therefore, appropriate solutions are urgently needed to develop the digital skills of citizens so that they become digital citizens and actively participate in achieving the goal of developing digital government.

Based on the above conclusions, this study implies solutions for developing digital human resources to meet the goals of building and developing a digital government in Vietnam, including:

- Solution 1. Digital government is a new issue with no precedent. Therefore, in addition to training civil servants to develop basic digital skills to meet initial goals, localities need a strategy to develop digital skills for civil servants to meet the requirements of developing digital government in the face of changes in digital technology and the digital society. In the long term, localities should build and implement criteria for the digital skills of

civil servants when recruiting and evaluating the quality of civil servants annually. This helps create proactiveness for localities in terms of digital human resources directly performing public duties.

- Solution 2. Digital government is a new issue with no precedent. Therefore, in addition to training citizens to develop basic digital skills to meet initial goals, localities need a strategy to train and develop digital skills for citizens to create digital citizens, facilitating state governance processes in a digital environment; and simultaneously creating proactive digital human resources to supplement the public service. In the long term, localities should research and implement programs to popularize digital knowledge and skills, making them standard educational and training content applied appropriately to each

level and stage of education.

Thus, both civil servants and citizens are participants in the state governance process in the digital environment within the context of developing digital government. For civil servants, digital competence is a mandatory criterion when individuals become civil servants. For citizens, digital competence requires training policies starting from primary and secondary education to create digital human resources for the goal of digital transformation and the development of digital government at the local and national levels. Because when citizens possess digital competence and are proficient in handling administrative transactions/requests in the digital environment, the state governance in the digital environment of local governments will be effective, and the goals of digital transformation and the development of digital government will be achieved.

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