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Digital Transformation in Vietnam and the Issue of Developing Digital Human Resources in State Governance

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Abstract

Digital transformation is becoming a trend for countries; it is not simply about applying technology to the organization and operation of state agencies, but also a comprehensive change in mindset, operating models, and methods of state governance, providing efficient services, creating new value, and promoting sustainable development. This change is reflected in the shift of state governance from a physical to a digital environment, creating a need for the development of digital human resources to perform public duties in the digital environment (developing digital civil servants), and is a necessary solution to achieve the goal of digital transformation in state governance. This study develops a theoretical framework on digital transformation and the development of digital human resources in state governance (digital knowledge and skills of civil servants; digital work capacity of civil servants). The theoretical model consists of two independent scales/variables: "Digital knowledge and skills of civil servants" (KS) and "Digital working capacity of civil servants" (WC), and one independent scale/variable: "State governance in the context of digital transformation" (SG). Based on this theoretical framework and model, this study surveys the opinions of 360 local government leaders at the commune level to collect information and conduct empirical analysis and evaluation of the digital capacity of civil servants and its impact on state governance in the context of digital transformation in Vietnam. Based on the conclusions of this empirical research, the author discusses policy solutions for developing digital human resources in state governance to meet the requirements of digital transformation in Vietnam.

Keywords: Digital transformation; State governance; Digital human resources; Vietnam.

1. Introduction

In 2016, the Fourth Industrial Revolution (Industry 4.0) emerged, leading to rapid development of digital technology and the formation of a digital transformation trend in the governance of various types of organizations. In state governance, Vietnam has adapted to this digital transformation trend, and the government has developed and implemented a national digital transformation program with the goal of building a modern, professional administration that better serves the people (PM, 2020).

The period 2020-2025 marks a shift in thinking and methods of state governance with the application of digital technology to build a modern, service-oriented administration; Vietnam is becoming a country that adapts quickly to technology: The digital technology sector will contribute approximately 15% of GDP in 2024 and is projected to reach 20% by 2030 (CPV, 2024). And the important tasks and solutions for implementing the strategy for the development of science, technology, and innovation until 2030 are identified as: Digital transformation and modernization of state governance (MST, 2025).

Although Vietnam's national digital transformation program is being implemented and has achieved initial results, laying the foundation for building and developing a digital government, digital transformation is a new issue with no precedent in state governance. This also poses specific requirements that need timely research and adjustment,

attracting the attention of many experts, researchers, and managers. This is also the reason that attracted the author's interest in conducting this research.

2. Literature review

State governance in the context of the 4.0 revolution is inseparable from the trend of digital transformation. In other words, digital transformation is inevitable, significant, and directly impacts the effectiveness of state governance. Many recent studies (Giang, P.T., 2024; Huong, D.T.T., 2025) affirm that digital transformation in state governance aims at developing a digital government, a digital economy, and a digital society to better serve the people; state governance activities are now shifting from a physical environment to a digital environment; state agencies establish digital operating models and build digital data that allows civil servants and citizens to access and transact in the digital environment.

According to Luca, T. et al. (2021), state governance in the digital transformation trend represents a change in the method of operating and providing public services, carried out in a digital environment, saving time and costs for both government agencies and citizens. Regarding this issue, Son, V.T. et al. (2021) further explains that in the context of digital transformation, information processing is mainly handled by artificial intelligence, so many state institutions become redundant and need adjustment, primarily through digital operating models, management on digital technology platforms, and the development of digital data. Similarly, Hung, D.V. (2022) emphasizes that state governance in the context of digital transformation is a gradual shift from the traditional state governance system to a network governance model, including a system of institutions arranged and connected vertically and horizontally to diversify resources. At this time, government agencies will apply digital technologies to support the provision of services to citizens in an open and transparent manner; citizens will be able to conveniently monitor government activities through open data systems.

With scientific approaches and detailed interpretations, state governance in the context of digital transformation is summarized by the studies above as having the following implications: A digital operating model is established, and the administrative activities of government agencies are carried out securely in the digital environment; government agencies build and operate digital data systems, allowing civil servants and citizens to access and transact securely in the digital environment; a digital culture and digital society are gradually forming and developing; civil servants perform their duties and citizens monitor public service activities conveniently through open data systems.

State governance in the context of digital transformation is characterized by the fact that the administrative activities of government agencies are carried out in a digital environment. Therefore, the digital workforce – digital civil servants – plays a direct and decisive role, because they are the direct and frequent subjects performing state governance tasks in the digital environment. In the current common understanding, the digital capacity of civil servants is reflected in two main aspects: their digital knowledge and skills, and their digital work capacity.

- Firstly, the digital knowledge and skills of civil servants are prerequisites for the formation of their digital competence. According to Hoa, L.Q. et al. (2023), state governance in the context of digital transformation requires training, equipping, and updating basic digital knowledge and skills for civil servants to adapt to the digital working environment. Sharing the same view as Hoa, L.Q. et al. (2023), Hoan, D.M. (2024) and Khanh, T.T.B. (2025) further emphasize that proactively equipping and updating digital knowledge and skills should be done regularly by civil servants, because they are the direct subjects performing public duties in state governance processes, while the development of digital technology is rapid and directly impacts state governance. The contents expressing the essence of civil servants' digital knowledge and skills are generally explained in the above studies, including: Civil servants are equipped with and updated on basic digital knowledge and skills to meet job title standards and state governance in the context of digital transformation; civil servants are trained and developed in digital knowledge and skills to meet the standards of digital human resources for achieving digital transformation goals in state governance; civil servants proactively equip themselves with and update digital knowledge and skills to adapt to the digital working environment and state governance in the context of digital transformation.

- Secondly, the digital work capacity of civil servants is a criterion for evaluating the performance of civil servants in the digital environment. According to Tuyen, H.T.M. (2023), digital work capacity is reflected in the aspects of advising and implementing assigned tasks in the digital environment. Que, N.D. et al. (2022) and Khanh, T.T.B. (2025) identify the implementation of professional work in the digital environment and the ability to transact and interact with citizens in the digital environment as criteria for evaluating the digital work capacity of civil servants; because when professional work and interaction and transactions are performed proficiently by civil servants in the digital environment, it will save time for both civil servants and citizens when participating in state governance. The content of the digital work capacity of civil servants as interpreted by these studies shows the following

general contents: Civil servants utilize proficient digital knowledge and skills to advise on and implement tasks in the digital environment; Civil servants utilize proficient digital knowledge and skills to interact and coordinate the implementation of tasks in the digital environment; Civil servants use proficient digital knowledge and skills to conduct transactions and guide citizens in resolving their requests in the digital environment.

Overall, numerous studies have highlighted the characteristics of state governance in the context of digital transformation and the digital competency requirements for civil servants – digital civil servants. The author synthesizes, builds upon, and develops these research findings to construct a theoretical framework for their study, as shown in Table 1 below.

Table 1. Theoretical framework

Research content	Related research	Developing research scales.
1. Digital knowledge and skills of civil servants (KS)		
Providing training and professional development to equip and update civil servants with basic digital knowledge and skills to adapt to the digital work environment.	Hoa, L.Q. et al. (2023); Hoan, D.M. (2024); Khanh, T.T.B. (2025).	1. KS1. Civil servants are equipped with and updated on basic digital knowledge and skills to meet job title standards and state governance in the context of digital transformation. 2. KS2. Civil servants are trained and developed in digital knowledge and skills to meet the standards of digital human resources for achieving digital transformation goals in state governance. 3. KS3. Civil servants proactively equip themselves with and update digital knowledge and skills to adapt to the digital working environment and state governance in the context of digital transformation.
2. Digital working capacity of civil servants (WC)		
- Ability to advise and implement assigned tasks in a digital environment. - The ability to transact and interact with people in the digital environment.	Tuyen, H.T.M. (2023); Que, N.D. et al. (2022); Khanh, T.T.B. (2025).	4. WC1. Civil servants utilize proficient digital knowledge and skills to advise on and implement tasks in the digital environment. 5. WC2. Civil servants utilize proficient digital knowledge and skills to interact and coordinate the implementation of tasks in the digital environment. 6. WC3. Civil servants use proficient digital knowledge and skills to conduct transactions and guide citizens in resolving their requests in the digital environment.
3. State governance in the context of digital transformation (SG)		
- Government agencies establish digital operating models and build digital databases that allow officials and citizens to access and transact in the digital environment. - The method of managing and delivering public services, carried out in a digital environment, saves time and costs for both	Luca, T. et al. (2021); Son, V.T. et al. (2021); Hung, D.V. (2022); Giang, P.T. (2024); Huong, D.T.T. (2025)	7. SG1. Digital operating model is established, and the administrative activities of government agencies are carried out securely in the digital environment. 8. SG2. Government agencies build and operate digital data systems, allowing civil servants and citizens to access and transact securely in the digital environment. 9. SG3. Digital culture and digital society are gradually forming and developing; civil servants perform their duties and citizens monitor public

Research content	Related research	Developing research scales.
government agencies and citizens.		service activities conveniently through open data systems.

Source: Compiled by the author through the review

Based on the research overview, the theoretical model of this study is designed with 02 scales/independent variables "Digital knowledge and skills of civil servants" (KS), "Digital working capacity of civil servants" (WC) and 01 scale/independent variable "State governance in the context of digital transformation" (SG) [Figure 1].

Research model

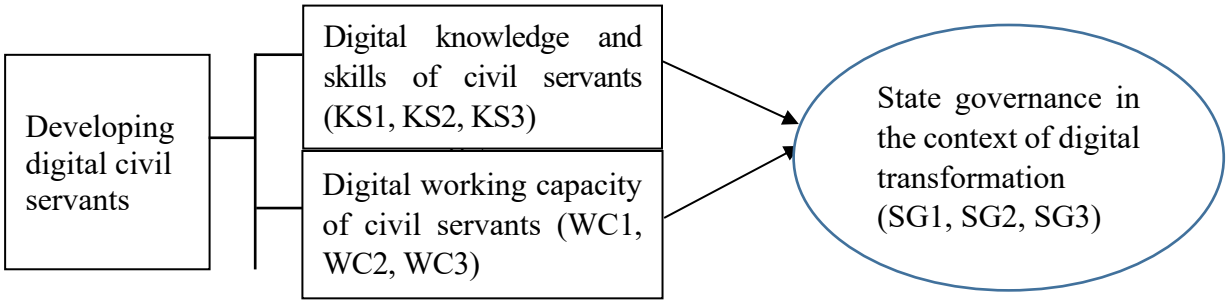

Figure 1. Research model

In the theoretical model above, 3 scales comprising 9 observed variables were designed as 9 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 (Figure 1). The author conducted a survey to collect data for analysis and drew conclusions from the empirical research in Vietnam with the hypothesis: Digital knowledge and skills of civil servants (H1) and Digital working capacity of civil servants (H2) have a positive and direct influence on State governance in the context of digital transformation.

3. Research methods

This study uses a combination of qualitative and quantitative methods to achieve its research objectives.

- Qualitative methods were used through the collection and analysis of secondary documents to build a theoretical model, consisting of two independent scales/variables: "Digital knowledge and skills of civil servants" (KS), "Digital working capacity of civil servants" (WC), and one dependent scale/variable: "State governance in the context of digital transformation" (SG) [Figure 1].

- The quantitative method involves collecting and analyzing primary data using survey tools, combined with exploratory factor analysis and regression analysis techniques to test the theoretical model and research hypotheses.

According to Hair, J.F. et al. (2009), the minimum sample size required for exploratory factor analysis and regression analysis of the 3-scale, 9-observed variable model in this study is: N = 9*5 = 45. The authors surveyed 360 local government leaders at the commune level in 3 provinces (N > 45), including Quang Ninh province (Northern), Lam Dong province (Central), and Tay Ninh province (Southern). The survey was conducted with the consent of the respondents, and the results showed that 360 out of 360 responses were valid, achieving a 100% response rate.

4. Research results and discussion

Based on the survey results with a sample size of N = 360 local government leaders at the commune level, the author performed Cronbach's alpha analysis to test the reliability of the scales and observed variables. According to Hair, J.F. et al. (2009), the scales and observed variables have reliability when meeting the standard conditions: Cronbach's alpha > 0.6; Corrected Item-Total Correlation > 0.3. Table 2 shows that the reliability test results for all 3 scales and 9 observed variables meet the above standard conditions, providing a basis for further analysis.

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. Digital knowledge and skills of civil servants (KS)	KS1	360	1	5	4.10	.670	.702	KS1 = .612
	KS2	360	1	5	4.06	.691		KS2 = .595
	KS3	360	1	5	4.11	.589		KS3 = .606
2. Digital working capacity of civil servants (WC)	WC1	360	1	5	4.03	.675	.679	WC1 = .532
	WC2	360	1	5	4.05	.683		WC2 = .581
	WC3	360	1	5	3.97	.618		WC3 = .494
3. State governance in the context of digital transformation (SG)	SG1	360	1	5	4.08	.696	.685	SG1 = .667
	SG2	360	1	5	4.10	.702		SG2 = .583
	SG3	360	1	5	4.06	.677		SG3 = .528
Valid N (listwise)		360						

Source: Author's survey results

Survey data (Table 2) shows that observations of the scales "Digital knowledge and skills of civil servants" (KS), "Digital working capacity of civil servants" (WC), and "State governance in the context of digital transformation" (SG) are all rated at a mean of ≥ 3.97, which is statistically significant according to the Likert scale (1-5). This contributes to confirming that a digital operating model has been established in state governance in Vietnam. Accordingly, state governance activities are carried out in a digital environment; civil servants have basic digital knowledge and skills, adapting to the digital working environment; a digital culture and digital society are gradually forming and developing; civil servants and citizens access and transact safely in the digital environment.

There is a significant difference in the values of the observed variables between the two scales measuring the digital capacity of civil servants. The observed variables of the "Digital working capacity of civil servants" (WC) scale are rated at the lowest average values: Mean (WC1) = 4.03, Mean (WC2) = 4.05, Mean (WC3) = 3.97. This indicates that although civil servants are equipped with and updated on basic digital knowledge and skills, many still lack proficiency in using these skills to advise, implement work, interact, coordinate, conduct transactions, and guide citizens in resolving requests in the digital environment. This issue requires timely and appropriate solutions to promote the development of digital capacity for civil servants in order to achieve the goals of digital transformation and state governance in the context of digital transformation.

With the test results meeting the standards, all three scales and nine observed variables in the theoretical model were 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 Table 3 and Table 4 below.

Table 3. Total Variance Explained

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.732
Bartlett's Test of Sphericity	Approx. Chi-Square	3836.172
	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	3.418	37.983	37.983	3.418	37.983	37.983	3.158	35.092	35.092

2	3.069	34.104	72.087	3.069	34.104	72.087	2.945	32.723	67.815
3	1.120	12.447	84.535	1.120	12.447	84.535	1.505	16.720	84.535
4	.510	5.664	90.199						
5	.476	5.291	95.490						
6	.154	1.714	97.205						
7	.128	1.424	98.628						
8	.086	.959	99.587						
9	.037	.413	100.000						

Extraction Method: Principal Component Analysis.

Source: Author's survey results

Table 4. Rotated Component Matrix

Rotated Component Matrix[a]				
Scales	Observed variables	Component		
		1	2	3
1. Digital knowledge and skills of civil servants (KS)	KS1	.864		
	KS2	.856		
	KS3	.825		
2. Digital working capacity of civil servants (WC)	WC1		.842	
	WC2		.855	
	WC3		.777	
3. State governance in the context of digital transformation (SG)	SG1			.840
	SG2			.835
	SG3			.875

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Source: Author's survey results

Survey data shows: KMO = 0.732 > 0.5, confirming that exploratory factor analysis is appropriate for the dataset; Bartlett's test has an observed significance level Sig. = 0.000 < 0.05, indicating that the observed variables are linearly correlated with the representative factor; Total Variance Explained with Cumulative % = 84.535% > 50%, showing that 84.535% of the variation in 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 stop at 3 factors with Eigenvalues > 1 (Table 3), indicating that the observed variables were extracted into 3 factors corresponding to the 3 original factors. Thus, the original research model is preserved and is scientifically appropriate; confirming the suitability of the theoretical research model on digital government, digital competence of civil servants, and digital competence of citizens, with 3 scales and 9 observed variables as constructed.

Based on the exploratory factor analysis results above, all three scales and nine observed variables have good reliability and statistical significance. Further multivariate regression analysis will be conducted to examine the relationships between the scales in the research model: two independent scales/variables "Digital knowledge and

skills of civil servants" (KS), "Digital working capacity of civil servants" (WC), and one dependent scale/variable "State governance in the context of digital transformation" (SG).

Table 5. Multivariate regression results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
		B	Std. Error	Beta			
1	(Constant)	1.115	.227		10.158	.000	
	1. Digital knowledge and skills of civil servants (KS)	.531	.368	.487	9.325	.000	1.774
	2. Digital working capacity of civil servants (WC)	.418	.309	.379	8.741	.000	1.796

a. Dependent Variable: State governance in the context of digital transformation (SG)

R^2 = 0.751; Durbin-Watson = 2.004

Source: Author's survey results

Table 5 data shows:

+ R^2 = 0.751, confirming that the scales "Digital knowledge and skills of civil servants" (KS) and "Digital working capacity of civil servants" (WC) explain 75.1% of the variation in the scale "State governance in the context of digital transformation" (SG); VIF = 1.774 and VIF = 1.796 (1 < VIF < 2), indicating that the regression model does not exhibit multicollinearity; Durbin-Watson = 2.004 (1 < d < 3), indicating that the regression model does not exhibit autocorrelation, confirming that the scales "Digital knowledge and skills of civil servants" (KS) and "Digital working capacity of civil servants" (WC) are independent and influence each other on the scale "State governance in the context of digital transformation" (SG), confirming the suitability of the theoretical research model with the survey dataset.

+ The regression coefficients of the two independent variables "Digital knowledge and skills of civil servants" (KS) and "Digital working capacity of civil servants" (WC) are both statistically significant (Sig. = 0.000, Sig. < 0.05) and positive: B(KS) = 0.531 and B(WC) = 0.418, confirming a positive correlation between the two independent variables "Digital knowledge and skills of civil servants" (KS), "Digital working capacity of civil servants" (WC) and the dependent variable "State governance in the context of digital transformation" (SG); hypotheses H1 and H2 are accepted; and the initial research model's suitability is further confirmed.

Based on the general regression model of Hair, J.F. et al. (2009): Y = Bo + B1*X1 + B2*X2 + … + Bi*Xi + e, the multivariate regression model of this study was determined as: SG = 1.115 + 0.531*KS + 0.418*WC. With this regression model, the survey results confirmed the correlation between the independent and dependent variables in decreasing order as follows: "Digital knowledge and skills of civil servants" (KS), "Digital working capacity of civil servants" (WC).

Based on the statistical analysis results (Table 2) and the regression analysis results (Table 5), the empirical research conclusion on digital transformation and the development of digital civil servants in Vietnam is affirmed as follows:

- Firstly, a digital operating model has been established in state governance in Vietnam. State administration activities are carried out in a digital environment; civil servants possess basic digital knowledge and skills, adapting to the digital work environment; a digital culture and digital society are gradually forming and developing; civil servants and citizens access and transact securely in the digital environment.

- Secondly, although civil servants are equipped with and updated on basic digital knowledge and skills, in reality, many still lack proficiency in using digital knowledge and skills to advise, implement work, interact, coordinate work, conduct transactions, and guide citizens in resolving requests in the digital environment.

To achieve digital transformation and state governance goals in the context of digital transformation, timely and appropriate solutions are needed to promote the development of digital capabilities for civil servants. Digital transformation in state administration aims to serve the people, addressing their needs quickly and accurately; and when civil servants are proficient in digital skills, professional tasks and collaboration, as well as transactions in

the digital environment, can be carried out smoothly. Based on the results of this empirical research, the author proposes solutions to develop the digital capabilities of civil servants towards the goals of digital transformation and state governance in Vietnam in the context of digital transformation. Accordingly, in addition to implementing policies to train and develop digital capabilities for civil servants according to their job positions, localities need to establish criteria for the digital capabilities of civil servants from the recruitment and job placement stages; and to develop criteria for digital capabilities when evaluating the quality of civil servants annually. Because digital transformation in public administration is an objective trend, and digital knowledge and skills are both a fundamental requirement and a high demand for civil servants in performing their duties. Individuals with digital knowledge and skills, when recruited as civil servants, become subjects performing public duties in the digital environment, meeting the needs of the people in the best possible way.

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