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Developing digital capacity of Vietnamese civil servants

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Abstract

The development of a digital society is a trend in every country, posing many new requirements on digital capacity for state agencies, civil servants, and citizens so that people's transactions with the state are carried out in the digital environment, and civil servants play the role of the subject in performing this task. This means civil servants must have digital knowledge and skills, form digital capacity to perform public duties, interact, and solve people's work in the digital environment. This study builds a theoretical framework on the digital capacity of civil servants, including (1) Competency in using digital technology, (2) Competency in exploiting digital data, (3) Competency in performing digital transactions. The author designs a theoretical model aimed at assessing the impact of these three digital capacities on the work results of civil servants in the digital environment. The survey was conducted with a sample size of N = 450 commune-level local civil servants from three provinces with difficult conditions and low growth in three regions of Vietnam, including Lai Chau province (North), Quang Ngai province (Central), and An Giang province (South). The research results show that commune-level local civil servants self-assess their digital capacity at a low level in all three of the above contents. This reality poses requirements for the development and implementation of training and fostering policies on digital capacity for local civil servants in Vietnam today. With that research conclusion, the author suggests some contents to improve policies to develop digital capacity and enhance the quality of local civil servants in Vietnam in the trend of a digital society.

Keywords: Digital capacity, Digital civil servant, Vietnam.

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1. Introduction

Local civil servants in Vietnam are established in the political system of three levels of local administrative units, including 63 provincial-level units, 705 district-level units, and 10,599 commune-level units [1]. Of which, the commune level is the lowest administrative level, with a staff of 6 civil servant positions, including: Commander of the Commune Military Command; Office - Statistics; Land - Construction - Urban and Environment (for wards and towns) / or Land -

Agriculture - Construction - Urban and Environment (for communes); Finance - Accounting; Justice - Civil Status; Culture - Society [2].

In the context of digital society development, commune-level civil servants are interested in developing their qualities and capacities to successfully implement the national digital transformation goal according to the Government's Program [3]. However, in 2025, Vietnam is implementing a reform to streamline the state apparatus [4]; it is expected to reduce 50% at the provincial level, reduce 60-70% at the commune level, and eliminate the district level [5]. The context of digital society development and this reform process will place new tasks on commune-level civil servants arising from the tasks of the district level in the trend of eliminating the district level; creating new requirements for professional capacity, digital capacity, becoming a factor that directly impacts and affects work results - the quality of civil servants.

The above issue is currently a matter of great concern in Vietnam. Accordingly, developing digital capacity and building digital human resources digital civil servants, serving public service activities is a priority issue; it is also the issue that attracts the author's attention in this study.

2. Literature Review

Digital capacity is a new requirement for social human resources and according to Nga [6], it is the ability of individuals and organizations to use digital technology to solve work problems to meet their needs and goals. Accordingly, each individual needs to be equipped with the necessary knowledge and skills to live, study and work in the trend of digital society development; each organization needs to invest in digital infrastructure, support and promote digital activities for human resources for the common development of the organization.

In the trend of digital society development, the Ministry of Information and Communications [7] affirms that digital capacity is an important content, deciding the formation of digital government, digital civil servants, and digital citizens. Accordingly, the connotation of digital capacity is emphasized in both cognitive and behavioral aspects and changes and creativity in cognitive, behavioral approaches and applications of digital technology to form digital skills in the working process of individuals civil servants and citizens. Many other studies also explain digital capacity according to the approach of Ministry of Information and Communications [7] that individuals with digital capacity - digital technology capacity, they can study, work, and socialize on digital platforms; actively and responsibly participate in the community in all political, economic, social, cultural fields... in the digital environment [8, 9]. The digital competency framework interpreted by the above studies includes requirements for understanding and implementation for individuals, which are: (1) Competency in using digital technology, (2) Competency in exploiting digital data, and (3) Competency in performing digital transactions. In this study, the author inherits the digital competency framework and builds theoretical content on the digital competency of civil servants, which is interpreted below.

- Firstly, competency in using digital technology is a basic competency and a mandatory requirement for civil servants to perform work in the digital environment. The “Competency in using digital technology” (UDT) scale implies the necessary requirements for civil servants, which are: Civil servants proficiently use technologies applied in professional work to perform tasks in the digital environment (UDT1); Civil servants proficiently operate electronic office system software applied in professional work to perform tasks in the digital environment (UDT2); Civil servants proficiently use smart devices applied in professional work to perform tasks in the digital environment (UDT3).
- Second, competency in exploiting digital data is the ability to access, use, and share information and data proficiently to perform assigned professional tasks in the digital environment. The scale of "competency in exploiting digital data" (EDD) implies the necessary requirements for civil servants, which are: Civil servants are able to identify, search for, and filter appropriate information; evaluate the accuracy and reliability of information in accordance with job requirements to perform tasks in the digital environment (EDD1); Civil servants are able to select and use appropriate tools to analyze, process, and store information effectively to perform tasks in the digital environment (EDD3); Civil servants are able to manage information and ensure information security to perform tasks in the digital environment (EDD3).
- Third, competency in performing digital transactions is the ability of civil servants to connect work and conduct transactions with organizations and individuals conveniently and safely to effectively resolve professional work in the digital environment. The scale "Competency in performing digital transactions" (PDT) implies the necessary requirements for civil servants, which are: Civil servants understand and identify information risks, cyber security, and communicate and share information in the digital environment proficiently and safely to perform tasks in the digital environment (PDT1); Civil servants connect digital information with organizations and individuals proficiently and safely to perform tasks in the digital environment (PDT2); Civil servants interact online proficiently and safely to perform tasks in the digital environment (PDT3).

For public sector organizations, the digital competency framework developed and implemented in civil servant assessment is both a new competency requirement for civil servants and a condition for civil servants to improve their working capacity and aim for good working results, meeting the requirements of public service activities in the trend of digital technology development and the digital society. In this study, the author inherits and develops the content of the scale "Working results of civil servants" (WC) in the context of digital technology development and the digital society of Hoan [10] to build a theoretical framework to study the impact of digital competency on the work performance of Vietnamese civil servants, including: Civil servants apply digital knowledge and skills to solve professional tasks and resolve people's records to ensure the progress of assigned work (WC1); Civil servants apply digital knowledge and skills to solve professional tasks and resolve people's records to ensure the quality of assigned work (WC2); Civil servants interact and transact proficiently

in the digital environment and handle work quickly and accurately, meeting requirements and creating satisfaction for people (WC3).

In the context of digital technology development, digital government, and digital society, the requirement for digital capacity is a basic necessity but also a high expectation for civil servants as digital technology becomes a new issue of the era. Digital capacity implies the ability to use digital technology, the ability to exploit digital data, and the ability to perform digital transactions, which are becoming conditions for the development of a digital society, directly affecting the work results of civil servants. With that in mind, this study puts forward the hypothesis: *Competency in using digital technology (H1), competency in exploiting digital data (H2), and competency in performing digital transactions (H3) are basic requirements that directly affect the working results of civil servants in the digital environment.*

From the overview study, the author built a theoretical framework on digital competence and the influence of digital competence on the working results of civil servants in the digital environment. The research model includes 3 independent scales/variables: "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT) and 01 dependent scale/variable: "Working results of civil servant" (WC). The above scales include 12 observed variables, designed by the author into 12 questions in the survey form and measured by the 5-level Likert scale: 1 - Strongly Disagree; 2 - Disagree; 3 - No opinion; 4 - Agree; 5 - Strongly Agree (Table 1, Figure 1).

Table 1.
Theoretical framework

No	Scales	Encode	Rating levels				
			1	2	3	4	5
I	Competency in using digital technology.	UDT					
1	Civil servants proficiently use technologies applied in professional work to perform tasks in the digital environment.	UDT1					
2	Civil servants proficiently operate the electronic office system software applied in professional work to perform tasks in the digital environment.	UDT2					
3	Civil servants proficiently use smart devices applied in professional work to perform tasks in the digital environment.	UDT3					
II	Competency in exploiting digital data	EDD					
4	Civil servants are able to identify, search for, and filter appropriate information; evaluate the accuracy and reliability of information in accordance with job requirements to perform tasks in the digital environment.	EDD1					
5	Civil servants are able to select and use appropriate tools to analyze, process, and store information effectively to perform tasks in the digital environment.	EDD2					
6	Civil servants are able to manage information and ensure information security to perform tasks in the digital environment.	EDD3					
III	Competency in performing digital transactions	PDT					
7	Civil servants understand and identify information risks, cyber security and communicate, share information in the digital environment proficiently and safely to perform tasks in the digital environment.	PDT1					
8	Civil servants connect digital information with organizations and individuals proficiently and safely to perform tasks in the digital environment.	PDT2					
9	Civil servants interact online proficiently and safely to perform tasks in the digital environment.	PDT3					
IV	Working results of a civil servant	WC					
10	Civil servants apply digital knowledge and skills to solve professional tasks and resolve people's records to ensure the progress of assigned work.	WC1					
11	Civil servants apply digital knowledge and skills to solve professional tasks and resolve people's records to ensure the quality of assigned work.	WC2					
12	Civil servants interact and transact proficiently in the digital environment and handle work quickly and accurately, meeting requirements and creating satisfaction for people.	WC3					

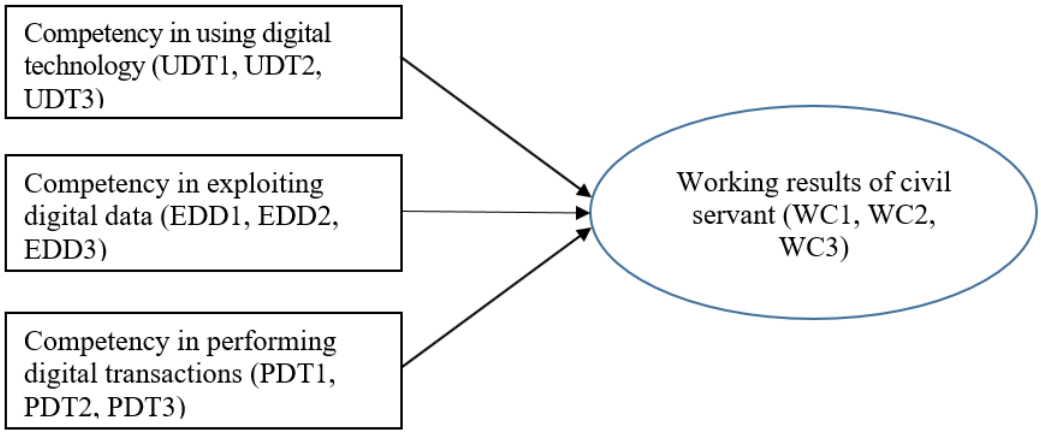

Figure 1.
Research model.

3. Research Methods

To conduct this study, the author used a combination of qualitative and quantitative methods. The qualitative method was implemented by collecting and analyzing secondary data to build a theoretical framework and research model. The quantitative method was implemented through surveys to collect and analyze primary data and draw research conclusions. The survey was conducted in two steps: a preliminary survey and an official survey.

- Preliminary survey: The theoretical model was built with 4 scales, 12 observed variables and according to Hai [11], the minimum sample size required for exploratory factor analysis and regression analysis for this research model is N = 12*5 = 60. The author conducted a preliminary survey in Lai Chau province with a sample size of N = 150 local civil servants at the commune level. The results of the preliminary survey in Lai Chau province showed that the observed variables were reliable enough to be used in an official survey on a larger scale.
- Official survey: The author conducted an official survey with a sample size of N = 450 local civil servants at the commune level of 3 provinces with difficult conditions and low growth, in 3 regions of Vietnam, including: Lai Chau province (North), Quang Ngai province (Central), A Giang province (South). The survey was conducted selectively, including civil servants aged 35 and over. And based on the consent of the survey respondents, the author collected 450/450 valid ballots, achieving a response rate of 100%.

4. Research Results and Discussion

First, the author tested the reliability of the scales and observed variables in the research model to serve as a basis for further analysis. According to Hai [11], the scales and observed variables are reliable when meeting the standard conditions: Cronbach's alpha> 0.6; Corrected Item-Total Correlation > 0.3. The test results show that all 4 scales and 12 observed variables are reliable when meeting the standard conditions (Table 2).

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. Competency in using digital technology (UDT)	UDT1	450	1	5	3.95	0.676	0.705	UDT1 = .338
	UDT2	450	1	5	4.02	0.684		UDT2 = .403
	UDT3	450	1	5	3.94	0.701		UDT3 = .411
2. Competency in exploiting digital data (EDD)	EDD1	450	1	5	3.73	0.712	0.717	EDD1 = .415
	EDD2	450	1	5	3.82	0.719		EDD2 = .423
	EDD3	450	1	5	3.78	0.714		EDD3 = .393
3. Competency in performing digital transactions (PDT)	PDT1	450	1	5	4.04	0.637	0.698	PDT1 = .495
	PDT2	450	1	5	3.92	0.704		PDT2 = .503
	PDT3	450	1	5	4.01	0.675		PDT3 = .494
4. Working results of civil servant (WC)	WC1	450	1	5	3.89	0.705	0.693	WC1 = .497
	WC2	450	1	5	3.95	0.696		WC2 = .504
	WC3	450	1	5	3.98	0.668		WC3 = .489
Valid N (listwise)		450						

Data in Table 2 shows that the observations of the scales "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT), "Working results of civil servant" (WC) are all rated at an average level of Mean ≥ 3.73, statistically significant according to the Likert scale (1-5). Accordingly, civil servants self-assess that they have basic digital competence, but at a low level; contributing to affirming the reality that there are still many civil servants who are limited in their ability to apply digital knowledge and skills to solve professional work, handle people's

records to ensure progress and quality of assigned work; there are still many civil servants who have not interacted, transacted proficiently in the digital environment and handled work quickly, accurately, meeting requirements and creating satisfaction for people.

The survey results also show that civil servants are limited in their ability to use digital technology, exploit digital data, and perform digital transactions. They need to be trained and supported to equip, update, and supplement their digital knowledge and skills to meet the requirements of public service activities in the context of a digital society. This also requires each civil servant to proactively study and foster their development of digital capacity; at the same time, it also requires government agencies to effectively implement training and support policies, training, fostering, and encouraging initiatives to develop civil servants' digital capacity.

With the standard test value, 4 scales and 12 observed variables in the research model continue to be used to perform the next analysis. The author analyzes the exploratory factor with Varimax rotation to preliminarily assess the unidimensionality, convergent value, discriminant value of the scales and test the suitability of the theoretical model. The analysis results are shown in Tables 3 and 4.

Table 3.
Total Variance Explained.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.727
Bartlett's Test of Sphericity	Approx. Chi-Square	1680.739
	df	66
	Sig.	0.000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.679	30.661	30.661	3.679	30.661	30.661	2.724	22.702	22.702
2	2.723	22.692	53.353	2.723	22.692	53.353	2.136	17.796	40.498
3	1.252	10.436	63.790	1.252	10.436	63.790	1.998	16.648	57.147
4	1.119	9.322	73.112	1.119	9.322	73.112	1.916	15.965	73.112
5	0.871	7.260	80.372						
6	0.688	5.729	86.101						
7	0.492	4.102	90.203						
8	0.434	3.614	93.818						
9	0.247	2.059	95.877						
10	0.241	2.005	97.882						
11	0.170	1.417	99.300						
12	0.084	0.700	100.000						

Extraction Method: Principal Component Analysis.

Table 4.
Rotated Component Matrix.

Rotated Component Matrix[a]

Scales	**Observed variables**	**Component**				
		1	**2**	**3**	**4**	**5**
Competency in using digital technology (UDT)	SD1	0.724				
	SD2	0.711				
	SD3	0.748				
Competency in exploiting digital data (EDD)	KT1		0.725			
	KT2		0.694			
	KT3		0.681			
Competency in performing digital transactions (PDT)	GD1				0.705	
	GD2				0.727	
	GD3				0.698	
Working results of civil servant (WC)	KQ1					0.713
	KQ2					0.702
	KQ3					0.698

Note: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 10 iterations.

Data in Tables 3 and 4 show: KMO = 0.727 > 0.5, confirming that exploratory factor analysis is appropriate for the data set; Bartlett's test has an observed significance level of Sig. = 0.000 < 0.05, showing that the observed variables have a linear

correlation with the representative factor; Total Variance Explained with Cumulative % = 73.112% > 50%, showing that 73.112% of the variation in the representative factors is explained by the observed variables; the observed variables all have Factor Loading > 0.5, showing that the observed variables have good statistical significance; the observed variables are extracted into 04 factors corresponding to the 04 original factors with Eigenvalues > 1, showing that the original research model is kept intact and is scientifically appropriate; confirm the suitability of the theoretical model of research on digital competence of civil servants with 4 scales, 12 initial observed variables.

With the above exploratory factor analysis results, all 4 scales and 12 observed variables have good reliability and statistical significance. We continue to perform multivariate linear regression analysis to examine the relationship between the scales in the research model: 03 independent scales/variables "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT) and 01 dependent scale/variable "Working results of civil servant" (WC). The results of the regression analysis are shown in Table 5.

Table 5.
Multivariate regression results.

Coefficients[a]							
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**VIF**
		B	**Std. Error**	**Beta**			
1	(Constant)	1.034	0.335		12.834	0.000	
	Competency in using digital technology (UDT)	0.434	0.237	0.415	9.738	0.000	1.786
	Competency in exploiting digital data (EDD)	0.262	0.188	0.238	8.112	0.000	1.755
	Competency in performing digital transactions (PDT)	0.279	0.206	0.255	6.859	0.000	1.805

Note: a. Dependent Variable: Working results of civil servant (WC)
Adjusted R Square: 0.716; Durbin-Watson: 2.106.

The data in Table 5 shows that:

+ Adjusted R Square = 0.716, confirming that the scales "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT) explain 71.6% of the variation in the scale "Working results of civil servant" (WC); the built multivariate regression model fits the data set; confirming the suitability of the initial research theoretical model on digital competence of civil servants with 4 scales and 12 observed variables.

+ VIF = 1.786, VIF = 1.755, VIF = 1.806 (1 < VIF < 2), showing that the regression model does not have multicollinearity; Durbin-Watson = 2.106 (1 < d < 3), showing that the regression model does not have autocorrelation.

+ The regression coefficients of the three independent variables "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT) all have positive values (B > 0), all have statistical significance (Sig. < 0.05), showing that the scales "Competency in using digital technology" (UDT), "Competency in exploiting digital data" (EDD), "Competency in performing digital transactions" (PDT) all have positive correlations with the scale "Working results of civil servant" (WC); hypotheses H1, H2, H3 are accepted.

Based on the generalized regression model Y = Bo + B1*X1 + B2*X2 + … + Bi*Xi (Hai, D.H., 2019), the multivariate regression model of this study can be determined as follows: WC = 1.034 + 0.434*UDT + 0.262*EDD + 0.279*PDT

Based on the above regression model, it can be seen that the correlation level of the independent variables and the dependent variables in decreasing order is: "Competency in using digital technology" (UDT), "Competency in performing digital transactions" (PDT), "Competency in exploiting digital data" (EDD). This contributes to further confirming the empirical research results on the digital capacity of Vietnamese local civil servants. Firstly, local civil servants have basic digital capacity, but at a low level; there are still many civil servants who are limited in their ability to apply digital knowledge and skills to solve professional tasks and handle people's records to ensure the progress and quality of assigned work. Additionally, there are still many civil servants who are not proficient in interacting and transacting in the digital environment and handling work quickly and accurately, meeting requirements, and creating satisfaction for the people. Secondly, local civil servants are limited in their ability to use digital technology, exploit digital data, and perform digital transactions. They need to be trained and fostered to equip, update, and supplement digital knowledge and skills to meet the requirements of public service activities in the context of a digital society.

The above reality requires proactive learning and training for each civil servant to develop digital capacity; at the same time, it also requires government agencies to effectively implement training and development policies, training, fostering, and encouraging initiatives to enhance the digital capacity of civil servants. The implementation of these training, fostering, and encouraging policies is necessary and meaningful. The development of a digital society is a trend that affects public service activities, requiring a wealth of information, knowledge, and digital skills to be updated for civil servants. When civil servants do not promptly recognize the need for change to proactively learn, and when government agencies do not have regular incentive policies, it will lead to a situation where civil servants lack the initiative to train, update, and supplement their digital knowledge to align with the development of the digital society and apply it in public service performance. This is a factor that greatly affects the results of task implementation in the digital environment, impacting the quality of local civil servants in Vietnam today.

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