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Digital Transformation: Smart Strategy in Administrative Reform in Vietnam

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Abstract

Objectives: Digital transformation is becoming such a big trend that countries worldwide cannot resist because it brings prosperity and development to social progress. Therefore, countries, especially emerging countries, need to quickly bring the latest technology advances into socio-economic development. Therefore, the purpose of the article is to point out the theoretical issues of digital transformation, the advantages and challenges, and their impact on Vietnam's provincial administrative reform and forecast the trend of impacts of the digital transformation to administrative reform at the provincial level. *Methods/Analysis:* Qualitative and quantitative research methods have been used together, in which quantitative methods used available literature sources. The qualitative method has been developed based on designing two questionnaires on digital transformation and administrative reform, thereby exploring the current results of digital transformation and administrative reform in a cross-section. *Findings:* Research has shown that the reality of digital transformation and administrative reform in provincial administrative agencies in Vietnam is still limited. Although administrative reform is superior to digital transformation, they are closely positive related. *Novelty /Improvement:* Research shows that administrative reform at the provincial level in Vietnam will become more competent and more efficient when administrative agencies promote the application of digital transformation; both digital transformation and administration reform need to be concerned at the same time. Moreover, a more focus on developing digital capacity and skills for civil servants is necessary for digital transformation and administrative reform to achieve high efficiency.

Keywords: Digital Transformation; Administrative Reform; Provincial Administrative Agencies; Vietnam.

1. Introduction

The concept of digital transformation is becoming familiar and increasingly popular in countries around the world, especially since the outbreak of the Covid-19 pandemic; many countries which have imposed blockade orders and social distancing make administrative activities to become chaotic, but the administration must still operate. Ustundag and Cevikcan [1] have shown that digital transformation changes our era with other eras; it brings not only about a change in the way citizens live and work but also highlights the concept of intelligent interactive products. Some forecasts were published in 2017; digital transformation brought positive results, contributes to GDP up to 20% [2], but due to the impact of the Covid-19 pandemic, this process has happened faster than expected. Many fields are forced to quickly implement digital transformation to maintain operations if they do not want to bankrupt or terminate their operations. Facing this situation, accelerating the digital transformation is a wise and intelligent step, making the administration uninterrupted and social management activities still running smoothly. However, due to the interdisciplinary nature of digital transformation leading to the lack of widely accepted definitions, there are even arguments that digital transformation is not a new concept, just is merely a new trade direction of a previous trend [3].

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The debate around the concept of digital transformation will still occur in the community of researchers; each industry, each field of researchers, will have its concepts, even many different views about digital transformation. Therefore, it is not easy to find a general consensus on a standard model for digital transformation. Nevertheless, the impressive achievements digital transformation brings when countries quickly move from the traditional production process to the digital transformation stage is no denying. Recent assessments have shown that significant changes, which are related to national development in leadership and management decisions, are related to digital transformation [4]. Furthermore, digital transformation can replace traditional workflows with modern digital ones, improve workflow efficiency and reduce technical errors; increase beneficiary satisfaction and increase reinvestment; cut operating costs, lead to and make decision faster and more accurate thanks to timely and transparent reporting system [5]. Therefore, all countries have a common interest in accelerating the digital transformation process, which state administrative agencies are promoting administrative reform based on digital transformation applications.

The Vietnamese Government has shown a high determination for digital transformation, as evidenced by the fact that in 2019, the Government [6] issued the "Draft Scheme for National Digital Transformation." On June 3, 2020, the Prime Minister of Vietnam [7] issued Decision No. 749//QD-TTg approving the National Digital Transformation Program by 2025, with orientation towards 2030. After that, the Ministry of Information and Communication [8] issued the "Digital Transformation Manual." These affirm the Government's very high political determination to realize the digital transformation process, with the ambitious goal that by 2025, Vietnam will be in the Top 4 in ASEAN in terms of national digitalization ranking, in the state administrative agency with the motto: "Connecting, the citizens are the service center; Efficiency, effectiveness, and innovation; Data-driven and open data" [6]. Moreover, the Government of Vietnam has set a target that by 2025, 80% of online public services will be at level 4, the digital economy will account for 20% of GDP, and a vision to 2030 with a target of 100% of online public services at level 4, the digital economy accounts for 30% [7].

In order to adapt and successfully implement the digital transformation process, Vietnam will face many difficulties and challenges. The Communist Party of Vietnam frankly stated that the national digital transformation process is still slow and lacks initiative due to limited infrastructure for digital transformation [9]. In particular, the human resources lack digital skills, lack a robust enough information technology platform to enable digital transformation, lack of digital thinking, or challenges in terms of organizational culture and digital transformation model consistent with the current scale [2]. Although the difficulties and challenges to successfully carry out the digital transformation process at this time are not small, the Vietnam Ministry of Politics has set a forth to renew thinking and action, consider it a breakthrough solution with a step-by-step and a right path which is a condition for Vietnam to make a breakthrough in socio-economic development, quickly complete digital transformation in state administrative agencies, promote the development of science, technology, and innovation across all industries and fields and promote national digital transformation, focus on developing the digital economy, building smart cities, e-government, moving towards digital Government [9].

Because the Covid-19 pandemic can still last, countries cannot but apply digital transformation to administrative reform. The advantages that digital transformation in administrative reform bring to prosperity and sustainable development have been confirmed in practice. However, the digital transformation in the state administrative agencies will is not small; but digital transformation is an objective and inevitable requirement, and it is the general trend in the world. The article focuses on analyzing and clarifying the concept of digital transformation, building a common understanding of digital transformation as a driving force to introduce beneficial changes for strategies in administrative agencies, administrative reform, the relationship between digital transformation and administrative reform. The reality of digital transformation in administrative agencies through surveying and evaluating opinions of objects and citizens as beneficiaries of digital transformation and administrative reform in Vietnam. That is a realistic view of the diagnosis of the current digital transformation situation and the factors driving changes in digital transformation activities in state administrative agencies in Vietnam.

2. Review of Literature

2.1. History of Digital Transformation in State Administrative Agencies

Since the early 90s of the 20th century, the computerization of processes has been introduced. After more than 30 years until now, humanity has witnessed the strong development of science into technology. The application of computers in life, which has promoted the formation and birth of new technologies such as big data (Big Data), Internet of Things (IoT), cloud computing (Cloud), augmented reality, has become more and more popular. In front of this reality, operating, leadership methods, working processes, and organizational culture in state administrative agencies have changed drastically. The working environment and management system have been digitally transformed; citizens have also put forth many new requirements for the administrative agencies. Therefore, the volume of work to be solved has also increased dramatically, posing many new problems for leaders and state management agencies to solve [10].

From the mid-2000s until now, smart devices and social platforms have strongly influenced the communication methods between the Government and the citizens, opening up new systems of working and interacting. The push to

digital platforms encourages high expectations for usability and revolutionizes citizens' experience in accessing public services [4]. In the wake of new technology, all industries are undertaking various initiatives to discover and exploit the technological benefits resulting from the digital transformation process. These lead to a transformation of state administrative agencies' operating model and affect the interaction between the Government and the citizens. Many governments, especially in countries with developed economies and science and technology, have rapidly implemented digital transformation; the communication between citizens and the Government has become more flexible, simpler, and higher.

The current reality places excellent demands on state agencies to change the operating way; the processes and organizational structures must also be restructured to suit the complex developments of society life. Deploying the social management model requires administrative reform, operating model changing that is no longer suitable based on digital transformation, starting from influencing leaders' thinking, changing organizational culture according to the operation of society [11]. All these factors are linked together into a phenomenon of digital transformation that meets the requirements of administrative reform. However, for any change, the role of the leader must always be that of a servant [12]. Countries, including developed countries as well as developing countries, are currently very active in applying digital transformation to administrative reform activities, consider this a strategic task for the administrative agencies to respond best and fastest, effectively serve the citizens.

2.2. Digital Transformation

The author has researched and synthesized from document sources that mentioned definitions compiled from the most prominent research and reports about digital transformation, shown in Table 1, to ensure the overall digital transformation as a common term. On the other hand, definitions given in recent times provide a comprehensive understanding of the concept of digital transformation that the author collects. The different definitions of digital transformation can be much more, generally in three fundamental aspects: organization, technology, and society.

Table 1. Definitions on Digital Transformation (Compiled based on author's choice)

Author(s)	Definition	Dimensions of Digital Transformation
Kotarba (2018) [3]	Digital transformation can be defined as the modification (or adaptation) of business models, resulting from the dynamic pace of technological progress and innovation that trigger changes in consumer and social behaviors.	Social aspect
Kozarkiewicz (2020) [13]	Digital transformation is a process in which digital technologies play a central role both in creating and strengthening disruptive changes taking place in industry (sector) and in society.	
Vietnamese Government [6]	Digital transformation is the use of data and digital technology to thoroughly and comprehensively change all aspects of socio-economic life, reshaping the way we live, work and relate to each other.	
Hai et al. (2021) [5]	Digital transformation contributes to the new shaping of the way citizens live, work, think, interact and constantly pursue practical experience, improve labor efficiency, fundamentally changes the way citizens work based on the application of modern technology, helps leaders enhance their ability to predict and plan the future to achieve the desired progress.	
Giao (2020) [14]	Digital transformation is the convergence of the four breakthrough technologies: cloud computing technology, big data, the internet of things (IoT), and artificial intelligence (AI).	Technological aspect
Antonopoulou et al. (2021) [10]	Digital transformation entails the birth of many innovations, such as the internet of things (IoT), digital networks, social networks, artificial intelligence (AI), machine learning (ML), and big data.	
Ministry of Information and Communication [15]	Digital transformation is the process of total and comprehensive change of individuals and organizations in the ways of living, working, and producing methods based on digital technology; the higher development of information technology allows faster computation, more data processing, more extensive capacity transmission at a lower cost.	Organizational aspect
Nguyen (2020) [16]	Digital transformation in administrative agencies aims to provide convenient public services to the citizens, enhance citizens's participation in state agencies' activities, and develop open data of state agencies to create conditions for socio-economic development,...	

Vietnam's point of view also acknowledges three aspects of digital transformation [6], [8] namely the social aspect, the technological aspect, and the organizational aspect:

- The social aspect emphasizes advantages, outstandings due to the impacts of digital transformation, creates new experiences for society. The implementation of digital transformation can improve and drastically affect daily life, exemplified by significant societal changes.
- The technological aspect introduces the new and improved technology products, enabling to use and enhance the quality and efficiency of work created by the achievements of technology. Key technology trends are listed, gathered to create digital transformation, allowing for savings in operating time.

- The organizational aspect aims to apply the development of science and technology, improve existing processes, and make them smarter, creating a positive change in the way of operation agencies and organizations and contributing to public service provision, socio-economic development. According to Tratkowska (2020) [4], this is the most promising aspect, becoming the subject of widespread interest in the future.

2.3. Digital Transformation in Vietnam

In Vietnam, in recent years, the digital transformation process has begun to occur, especially in many fields such as finance, transportation, tourism. To achieve this positive movement, the Governments and local governments at all levels have made great efforts towards Digital Government and Digital Local Government. Many cities are also actively building plans to become smart cities with new technology platforms. In 2020, Vietnam ranked 86/193 countries and territories, 24/47 in Asia, and 6/11 in Southeast Asia. Some remarkable achievements such as telecommunications infrastructure increased by 31 ranks, improved the Human Resources Index by three ranks, but dropped significantly in the Online Services Index, down 22 ranks. From 2014 until now, Vietnam has risen from 99th position to 86th position, reflecting Vietnam's efforts but not much. The gap between Vietnam and the following countries in Southeast Asia, such as Indonesia and Cambodia, has narrowed significantly. The online services index has been downgraded, the absolute score of 0.7361 in 2018 decreased to 0.6529 in 2020, from 59th in 2018 to 81st in 2020 [15].

The significant barriers that Vietnam's administrative agencies face in the digital transformation process are weak human resources and information technology foundation and a lack of digital leadership thinking. Moreover, investment in cloud technology, network security, software, and hardware upgrades for digital transformation is also quite limited. Not only that, there are still many administrative agencies that have not yet implemented and completed digital transformation activities due to the fear that digital transformation may cause a significant change in personnel, especially in long-term or critical positions and the level of technology available, as well as the anxiety of investing much technology which can make the team cost quite high. According to Nguyen (2020) [16], in current state agencies, information and communication technology has been applied in state agencies to develop e-government, contributing to administrative reform. However, the number of applications processed online (level 3, 4) is still low. The processing and administration via the network are still limited; national databases are slow to be deployed. The connection and sharing of data between state agencies are still slow. The application of digital transformation in state agencies to change the model and working towards digital transformation is not much.

With the determination to successfully implement the national digital transformation strategy, the challenges that have been raised are: 1) Digital infrastructure is not met; 2) Lack of resources and implementation capacity; 3) Personal data protection, network safety, and security; 4) The digital divide between groups of individuals is widening. Based on the difficulties, the management agency and the main task assigned to develop Vietnam's digital transformation strategy, the Ministry of Information and Communications [15] should have 9 pillars as the criteria to implementing digital transformation: 1) Vision, leadership thinking with innovation; 2) Legal and institutional framework for digital transformation; 3) Establishing mission, forming culture, supplementing functions and tasks on digital transformation; 4) Promote systems thinking and develop holistic approaches to policymaking and public service delivery; 5) Ensure data-driven decision-making and provide open data for socio-economic development; 6) Building broadband connection infrastructure, using advanced technology; 7) Mobilize resources in accordance with the plan and priority level for digital government development; 8) Capacity building of public administration training organizations to develop digital government human resources and 9) Development of digital skills for citizens.

Recently, the Ministry of Information and Communications [15], also made comparisons to show that the top 10 countries in the world have 6 remarkable commonalities as the basis for orientation for Vietnam's digital transformation strategy.

- Having a strategy to develop digital government/e-government.
- Having Government's open data regulation and a national data portal.
- Having regulations on identification and digital authentication.
- Having a set of development indicators.
- Having a portal for national public services.
- Having ideas, participate and lead regional and international development.

The application of digital transformation in administrative agencies has been paid attention to and spread across many areas that need transformation. However, most applications are still in the state of information and communication technology development. They have not really been digital transformation, so there has not been a breakthrough in model, process, and performance for citizens, as well as, limited citizens's ability to access digital transformation.

2.4. Administrative Reform in Vietnam

In Vietnam, administrative reform is an important part of the innovation process, promoting industrialization and modernization and better serving the citizens [17]. As early as 2001, the Prime Minister of Vietnam [18] approved the Master Program on State Administrative Reform for 2001-2010, 10 years later, the Government of Vietnam [19] issued a Resolution on the State Administration Reform Program. State administrative reform master program for the period 2011-2020 with 5 contents including:

- 1) Reforming institutions: Building and perfecting the legal and institutional system on property ownership;
- 2) Reforming administrative procedures: Reducing and improving the quality of administrative procedures in all areas. Publicizing and transparencying all administrative procedures, reforming administrative procedures in building institutions, and monitoring mechanisms for implementing administrative procedures by state administrative agencies at all levels.
- 3) Reforming the organization of the state administrative apparatus: Reviewing the position, functions, tasks and powers of the state administrative apparatus at all levels, on that basis, adjust the functions, tasks, powers and organization. Summarizing and evaluating the local Government's organizational model and operational quality to establish an appropriate organizational model. Innovating working methods of state administrative agencies;
- 4) Building and improving the quality of public service performance, public service ethics to serve the citizens, serving the country's development, and at the same time renovating the contents and programs of training and fostering civil servants. This is also an important basis for the innovation of leadership thinking [20];
- 5) Reforming public finance, efficiently using all resources for economy-society development.

In order to well implement 5 administrative reform contents, the Government of Vietnam has issued a request to modernize administration and promote the application of information technology in the activities of state administrative agencies, which are carried out in electronic form. However, with the determination to further accelerate the implementation of the Master Program on State Administrative Reform for the period 2011-2020. On February 4, 2016, the Prime Minister of Vietnam [21] continued to emphasize five administrative reform contents and selected administrative procedure reform as a breakthrough associated with administrative modernization. However, administrative modernization is only understood as modernizing the Government's electronic administrative information network, e-Government, and information technology application. However, some results have been quite positive, such as the system of legal documents being reviewed and revised, over 100,000 legal documents of all kinds. The application of information technology in handling administrative procedures at all levels of Government is also assessed to have positive changes. The organizational structure of state administrative agencies has been arranged, contributing to building a streamlined and reasonable apparatus commensurate with each agency's state management functions and tasks. It is noteworthy that administrative procedure reform has made great progress due to the increased capacity of civil servants to perform public duties, and many localities have recently paid attention to promoting digital transformation [22].

In addition to the achieved results, administrative reform in Vietnam in the past time on all six contents still has many limitations due to the slow application of the digital transformation process, leading to the settlement of administrative procedures including public services which often take a long time and consume human resources, so their efficiency is low, lead to stagnation in the operation of the apparatus, a large number of civil servants, but low work efficiency. Faced with the above limitations and the impact of the digital transformation process in the world, since 2019, the Government of Vietnam has given vital directions in digital transformation to implement administrative reform successfully, and the highest goal is to serve the citizens with the best public services, promoting socio-economic development.

2.5. The Relationship between Digital Transformation and Administrative Reform

It can be seen that digital transformation takes place in three aspects: social aspect, technological aspect, organizational aspect, and administrative reform, with five contents: institutional reform, administrative procedure reform, reforming the organization of the administrative apparatus, building and improving the quality of the contingent of civil servants, and reforming public finance. There is a relationship between the aspects and contents of administrative reform. When the administration has not been digitized, it operates traditionally; there will inevitably be many cumbersome administrative procedures and bureaucracy in civil servant's work. On the contrary, when moving to the stage of digital transformation in administrative agencies, forcing the administrative apparatus to change the traditional model to the digital administrative model, making the Government operate more effectively and transparently, reducing corruption [8].

The introduction of the digital transformation process is clearly to better serve citizens's lives, along with that, administrative reform aimed at improving the effectiveness and efficiency of the state's operations; is an essential factor

promoting socio-economic development; is the focus of the work of reforming the state apparatus in order to build a democratic, unified administration with sufficient power and capacity to serve the citizens better [22]. The efficiency and effectiveness of the state apparatus operating in the traditional form will require enormous human resources. The interaction between the citizens and the Government according to the mechanism of direct interaction with paper documents is not only a waste of time but also causes a waste of human resources and many unavoidable consequences. Thus, digital transformation in administrative agencies will go hand in hand with administrative reform, and if administrative reform is to be effective, it is impossible not to implement a digital transformation, which is both a strategy and an intelligent solution if countries want to move towards the intelligent nation, Government becomes the digital Government.

In an emerging country like Vietnam, there are significant barriers that science and technology are still backward, especially the level of access to technology, digital thinking capacity, digital skills of civil servants as well as the number of citizens are still limited, so the administrative efficiency is also limited [16]. Nevertheless, digital transformation is a practically irresistible requirement in the development and international integration of Vietnam. Suppose the digital transformation process is directed by the Government and authorities at all levels to be implemented drastically and synchronously between digital transformation and the drastic administrative reform. It will promote innovation and socio-economic in Vietnam successfully. In addition, the contingent of civil servants in administrative agencies must have sufficient capacity and level of digital thinking, must become servants [12], moreover, the organizational structure of the apparatus will be streamlined to suit the needs of the operation of the digital transformation process. On the citizen's side, they must actively learn the application of digital transformation to participate in public services, become a part of the digital transformation process, and interact between administrative agencies and citizens in the digital environment.

3. Research Design / Methods

3.1. Research Questions

Digital transformation is a topic of interest to the Government of Vietnam, improving citizens's quality of life and reducing social distance. To assess how digital transformation status has impacted and brought to effective administrative reform, authors used qualitative and quantitative analysis to explore the impact of transformation in administrative reform strategy in the local governments of Vietnam. Therefore, the study was conducted with a cross-sectional design with two different questionnaires used; one questionnaire aims to detect the level of digital transformation implementation on all three aspects: social aspect, technological aspect, and organizational aspects and a questionnaire on digital transformation [8], a questionnaire to determine the current status of administrative procedure reform, state apparatus reform, building and improving the quality of the contingent of civil servants [21]. In addition, studies on the same topic are examined more closely in the discussion to explain and analyze how the impact of digital transformation affects administrative reform to analyze the advantages and the challenge of digital transformation because this process is still going on for a long time. Based on what has been reported and guided by the current literature, the research questions are summarized as follows (Figure 1):

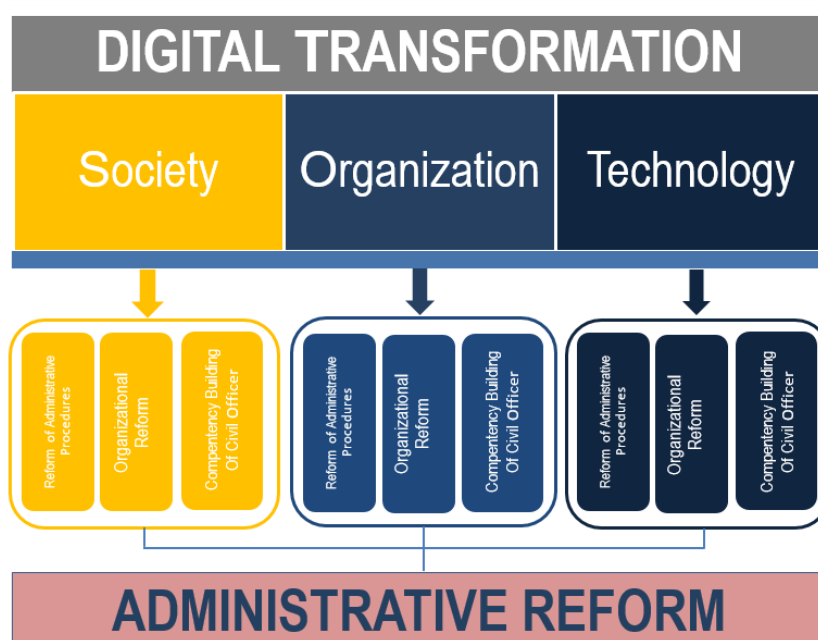


Figure 1. Flowchart of Research Methodology

Research Question 1: How does digital transformation under the social aspect affect administrative reform in provincial administrative agencies in Vietnam?

Research Question 2: How does digital transformation from an organizational perspective affect administrative reform in provincial administrative agencies in Vietnam?

Research Question 3: How does the digital transformation from a technology perspective affect administrative reform in provincial administrative agencies in Vietnam?

Research Question 4: How is digital transformation and administrative reform related?

3.2. Data Collection Tools

Quantitative research has been carried out to answer the research questions by searching for sources from the available data, from that to identifying research questions; from which to build a questionnaire with scales contains appropriate questions and measurable responses, and collect data through a survey of the opinions of survey participants. Collected data will be conducted based on the use of statistical methods. Two questionnaires have been developed and included in the study, the first of which investigates the digital transformation [8]:

- Digital transformation in state administrative agencies at the provincial level, in administrative agencies, public administrative service centers under the Provincial People's Committee of Vietnam in solving social problems: contributing to improving improve people's quality of life, reduce social distance;
- Technology development: network management, application, exploitation of national databases, connection and sharing of data between administrative agencies, application of advanced digital technologies in administrative agencies to change the model, the way of working;
- Applying digital transformation to the organizational development strategy;
- The second questionnaire includes questions about administration reform [21];
- Reforming administrative procedures;
- Reforming and building the state administrative apparatus;
- Building and improving the quality of public service performance, who must be technologically savvy and apply technology to serve, have the potential to lead creatively in the technology application and development, can be pioneers in information technology filed [23].

Both questionnaires were used to give respondents a scale of 1 (Poor) - 5 (Good). The questionnaires were sent to civil servants, leaders in administrative agencies in 10 provinces of Vietnam and citizens, as beneficiaries of the application of digital transformation in administrative reform. The survey was conducted in a cross-sectional manner in April 2021. Respondents were asked to rate the frequency with achievement levels they expressed on each question. Each individual will give an answer based on their understanding or experience. The obtained data will be coded, analyzed, and processed on the statistical software SPSS 24.0. Correlation between variables was performed by regression analysis..

3.3. Measures and Data Analysis

After data were collected from two digital transformation questionnaires and administrative reform questionnaires, these data were coded and entered into the statistical software SPSS 24.0. Different variables were extracted; on that basis, descriptive and inductive operations were used to analyze the data for each group of variables. Demographic variables are described and analyzed related to digital transformation and administrative reform, and charts perform data analysis operations by number and percentage of demographic statistics. Pearson parameters Chi-Square, Fisher, and linear regression, were used to conduct the inductive method because it is consistent with the study [10].

With the social, technological, and organizational digital transformations and the administrative procedure reform variables, the reform of the state administrative apparatus organization and the improvement of the quality of civil servants, the Descriptive method, inductive method through t-test and Mann-Whitney non-parametric statistical test to compare the mean of two independent samples were used.

Cronbach's alpha coefficient was used to measure the internal consistency of measurements in both digital transformation and administrative reform questionnaires. According to Finch and French [24], Cronbach's alpha coefficient was used to measure the internal consistency of measurements in both digital transformation and administrative reform questionnaires. According to Finch and French [23], the value of Cronbach's Alpha coefficient is only meaningful when $\alpha \geq 0.3$; the closer the coefficient α is to 1, the higher the consistency. Cronbach's alpha coefficient for the total digital transformation scale with $\alpha = 0.916$, in which the scale for social aspect digital transformation with $\alpha = 0.875$, the digital transformation scale in technology with $\alpha = 0.897$, and the scale for digital transformation in

organization filed with $\alpha = 0.902$. Cronbach's alpha coefficient for the administrative reform scale $\alpha = 0.896$. Cronbach's alpha coefficient on administrative reform with $\alpha = 0.862$, Cronbach's alpha coefficient on the scale of organizational reform with $\alpha = 0.815$, and Cronbach's alpha coefficient on the scale of the building and improving the quality of civil servants with $\alpha = 0.854$. Thus, the coefficients α all exceed the recommendation $\alpha = 0.70$. Besides, the study also examined the Pearson linear correlation coefficient between different operating variables and used regression to determine the dependence between the variables.

4. Results and Discussion

4.1. Demographic Characteristics

The study's total sample is 538 people, of which 356 are civil servants, and 182 citizens, to collect opinions to assess their understanding of the digital transformation process in the provincial state administrative agencies in Vietnam.

Statistics describing demographic characteristics in terms of gender show that most civil servants in the administrative agencies participating in the survey are men, with 57.58%, women only make up 42.41 percent. Regarding age, statistics show that the number of civil servants over 50 years old participated in the survey with only 8.98%, mainly in the age group 31-40 with 41.57%. The remaining age groups under 30 years old accounted for only 19.38%, and those aged 41-50 accounted for 30.05%. Statistics on educational attainment show that 100% of civil servants have a university degree or higher, of which 70.50% have a university degree, and up to 29.49% of civil servants have postgraduate education. According to the regulations of the Ministry of Home Affairs [25], from 2021, civil servants from the professional rank and above must have a university degree or higher, so this is a mandatory standard that all administrative, civil servants must meet. By employment position, up to 46.06% of people surveyed are between leadership positions, and 53.93% are civil servants who do not hold leadership positions. The number of trained civil servants in the natural sciences field accounts for a larger proportion, with 49.15% compared to the proportion of civil servants who have majored in the humanities and social sciences, with 41.01%, and in other disciplines with the rate of 9.83%. Demographic statistics are illustrated in Table 2:

Table 2. Demographic characteristics

Variable	Category	Number of Respondents	Percentage of Respondents
Gender	Male	151	42.41
	Female	205	57.58
Age	Under 30	69	19.38
	From 31 to 40	148	41.57
	From 41 to 50	107	30.05
	Over 50	32	8.98
Education	Higher Education	251	70.50
	Postgraduate	105	29.49
Job Position	Leader	164	46.06
	Staff	192	53.93
Subject Field	Humanities and Social Sciences	146	41.01
	Natural and Applied Sciences	175	49.15
	Other	35	9.83
Work	Citizen	182	33.83
	Officer	356	66.17

Besides, to ensure objectivity as well as people's understanding of the digital transformation process, 182 people were surveyed, 33.83% of the people interviewed all had stable jobs and were outside the public sector. They have higher education and university education. The officers with a total of 356 people, accounting for 66.17%. This full graph of the variables is shown (Figure 2) to see demographic statistics more clearly. From the descriptive demographic statistics in Figure 2, it is necessary to have descriptive statistics and analysis on the situation of digital transformation and administrative reform at the provincial level in Vietnam, where many groups of subjects are surveyed.

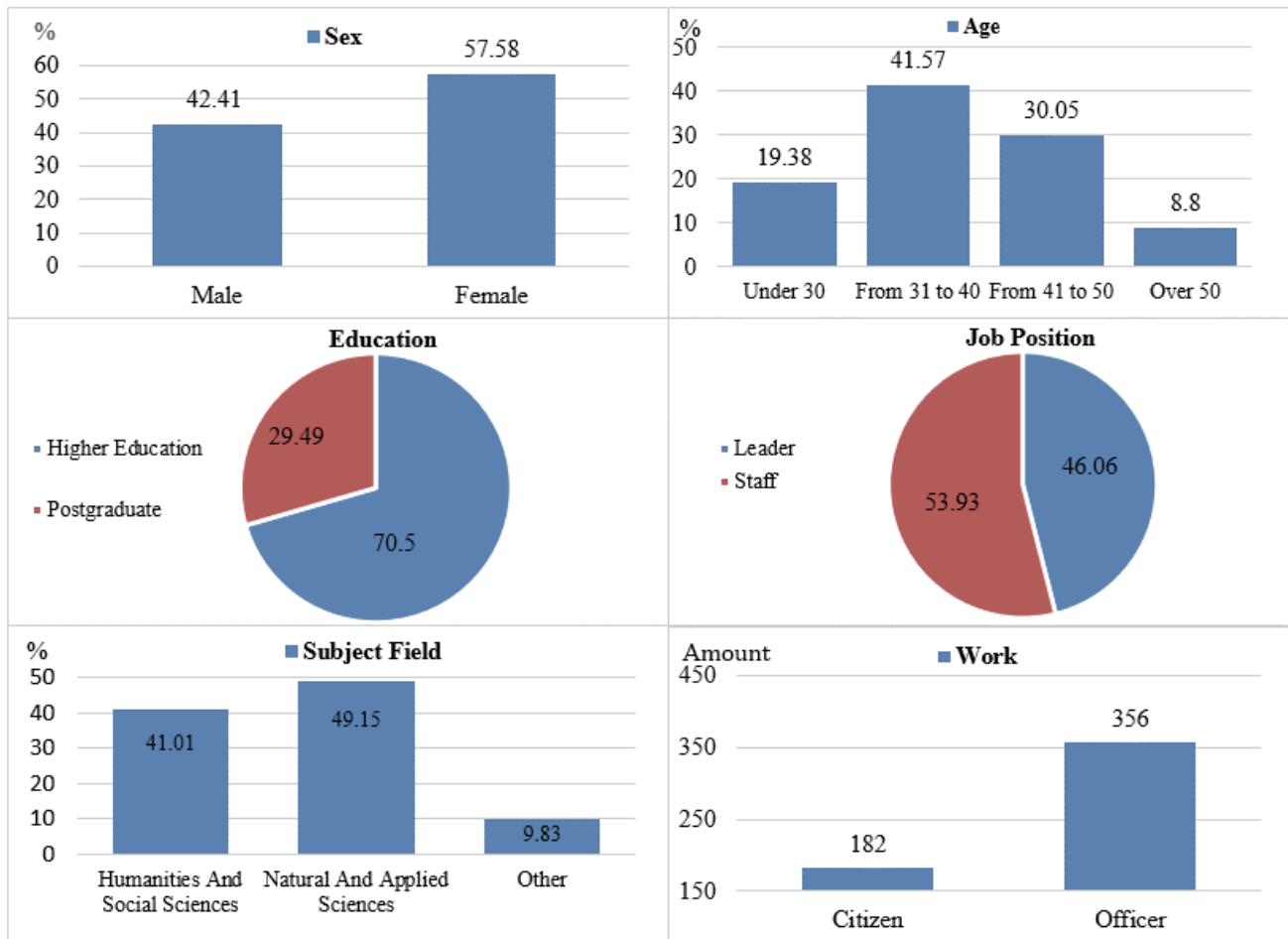


Figure 2. Sample Demographics

4.2. The Current Situation of Digital Transformation and Administrative Reform at The Provincial Level as Assessed by the Officers

Digital transformation and administrative reform at the provincial level assess by officers to determine the level of achievement, as officers are the subject of these two tasks.

Table 3. Digital transformation and administrative reform

Digital Transformation And Administrative Reform	N	M	SD	Cronbach's alpha	r					
					(1)	(2)	(3)	(4)	(5)	(6)
(1) Society	356	3.54	0.83	0.875	1					
(2) Technology	356	2.87	1.03	0.897	0.47*	1				
(3) Organization	356	3.18	0.86	0.902	0.34*	0.42*	1			
(4) The Reform of Administrative Procedures	356	4.05	0.92	0.862	0.56**	0.64**	0.60**	1		
(5) Organizational Reform Of The Administrative Apparatus	356	2.86	0.81	0.815	0.63**	0.57**	0.73**	0.64**	1	
(6) Competency Building Of Civil Officer	356	3.24	0.97	0.854	0.74**	0.67**	0.58**	0.71**	0.72**	1

Note: M: mean; SD: standard deviation; r: Pearson's correlation coefficient; Significance at: *p<0.05 and **p<0.01.

The mean (Mean) is shown as a histogram (Figure 3):

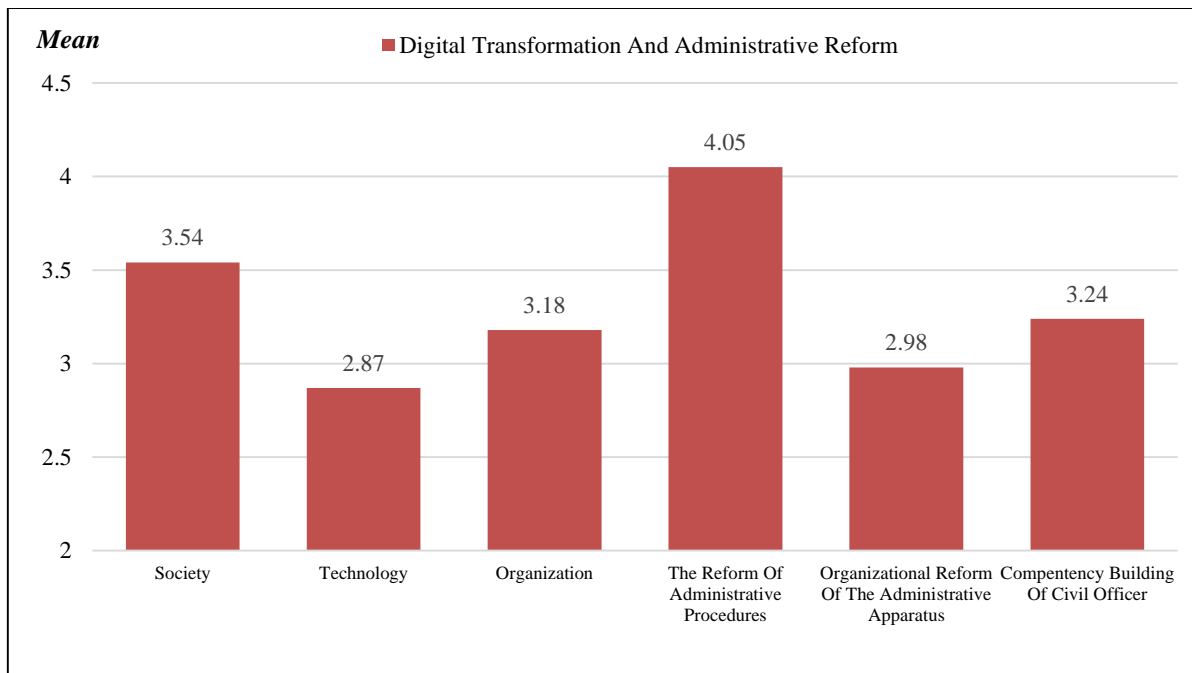
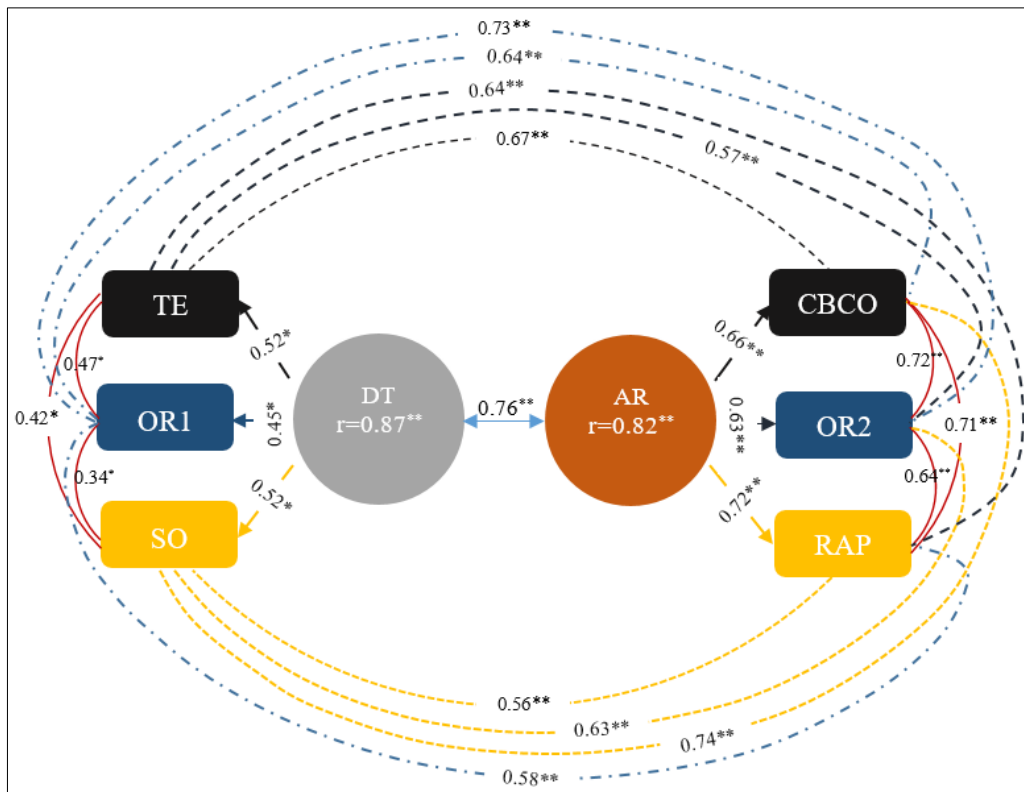


Figure 3. Digital transformation and administrative reform

The above results show that the average result in both digital transformation and administrative reform is not high. Each specific observed variable indicates that the administrative reform has outstanding results. But only with $M=4.05$, and in the social aspect in public service provision has not met expectations. According to Thai (2020) [26] Public services are mainly provided at a low level. Currently, level 2 public services are still widely used and still account for a large number, while online public services at level 3 are still widely used, level 4 the number of applications received is still limited; moreover, the processing of submitted and online applications is also limited. From a social perspective, digital transformation has been promoted in administrative agencies, but with $M=3.54$, this result is only quite average. This fact was revealed by Le Quang Thang [27] that corruption and negativity have occurred at many levels, sectors, and fields of different sizes. Including cases and incidents are happening in various industries and vital economic regions with large scale, sophisticated tricks, high degree of violation, loss, or heavy property damage.

In contrast, the organizational reform of the administrative apparatus has the results of the reform of the administrative apparatus with $M = 2.65$, and the digital transformation in terms of technology with $M = 2.87$ are not high results. Furthermore, the results of the assessment of digital transformation from an organizational perspective is $M = 3.18$. The administrative reform on building and improving civil officers' capacity has $M = 2.84$. Both of them have similar results and are not meet actual requirements. Although there is a very high determination to realize the digital transformation strategy, the assessment of this issue still has many challenges [6] The most significant limitation and also the biggest challenge is that the number of officers still has limited capacity in digital skills and digital leadership. It is recommended that digital transformation is irreversible. Leaders must be proactive in this process [28], to improve the results of administrative reform. To evaluate the study's measurement model, including testing the reliability of each variable in digital transformation and administrative reform, determining reliability, internal consistency, determining convergence value, and determine the discriminant value [29]. Figure 4 shows the measurement model in this study.

The Pearson correlation test shows all aspects of administrative reform: Administrative procedure reform is correlated with digital transformation in society, with $r = 0.56^{**}$, organizational reform with digital transformation technology, with $r = 0.64^{**}$ and building and improving the quality of civil officers, with $r = 0.60^{**}$. Reform the administrative apparatus, in society with $r = 0.63^{**}$, in technology with $r = 0.57^{**}$, in technology with $r = 0.73^{**}$. Building and improving the quality of civil officers, in society with $r = 0.74^{**}$, in technology with $r = 0.67^{**}$, in organization with $r = 0.58^{**}$. These correlations are quite close compared to the correlations between aspects of digital transformation. Correlation between social aspect and technology with $r = 0.47^{*}$, the correlation between social aspect with organization $r = 0.34^{*}$, and correlation between technological aspect with organizational aspect with $r = 0.42^{*}$.



(Note. DT: Digital Transformation; AR: Administrative Reform; TE: Technology; OR1: Organization; SO: Society; CBCO: Reform of Administrative Procedures; OR2: Organizational Reform; RAP: Competency Building Of Civil Officer).

Figure 4. Measurement model correlation between variables in digital transformation and administrative reform

4.3. Digital Transformation with a Demographic Perspective

It seems that there is no significant difference in gender between digital transformation and administrative reform process at the provincial level in Viet Nam, except for the technological factor according to men's assessment with M = 3.10 compared with the result in women, with M = 2.64. This difference is statistically significant through the results of the T-test analysis to determine this difference (with $p < 0.01$). To carry out digital transformation and administrative reform, both genders involved in these works are equally effective. Only the difference is in digital transformation in terms of technology. If women have better technology awareness in terms of technology, the digital transformation process can have a more positive impact, the effectiveness of administrative reform can be enhanced. Together with the estimates by gender variable, digital transformation and administrative reform on demographics by age variable were identified (Table 5).

Table 4. Digital transformation and administrative reform by gender variable

Administrative Reform	Sex	Mean	SD	Test	P-value
Society	Male	3.67	0.92	T-test	0.316
	Female	3.41	0.81		
Technology	Male	3.10	0.87	T-test	0.003 **
	Female	2.64	1.13		
Organization	Male	3.24	0.82	T-test	0.174
	Female	3.12	0.84		
The Reform of Administrative Procedures	Male	4.12	0.86	T-test	0.165
	Female	3.98	0.95		
Organizational Reform	Male	2.83	0.83	T-test	0.442
	Female	2.89	0.78		
Competency Building Of Civil Officer	Male	3.31	1.02	T-test	0.083
	Female	3.17	0.94		

**Correlation is statistically significant at level 0.01.

Table 5. Digital transformation and administrative reform by age variable

Administrative Reform	Age	Mean	SD	Test	P-value
Society	≤40	3.92	0.81	T-test	0.001**
	> 40	3.16	0.87		
Technology	≤40	3.14	0.96	T-test	0.000**
	> 40	2.60	1.05		
Organization	≤40	3.35	0.92	T-test	0.004**
	> 40	3.01	0.83		
Reform of Administrative Procedures	≤40	3.81	0.88	T-test	0.03*
	> 40	4.39	0.97		
Organizational Reform	≤40	2.54	0.85	T-test	0.000**
	> 40	3.20	0.80		
Competency Building Of Civil Officer	≤40	3.07	1.02	T-test	0.002**
	> 40	3.41	0.95		

*Correlation is statistically significant at level 0.05; **Correlation is statistically significant at level 0.01.

The T-test result showed a statistically significant difference according to the age variable ($p < 0.05$ and $p < 0.01$). A significant influence of age on digital transformation and administrative reform has been shown. In which, digital transformation on all three aspects of society, technology, and organization. People under 40 years old have more positive awareness and implementation of digital transformation than the age group over 40. Especially in terms of technology, the group under 40 years old ($M=3.14$) is significantly superior to the assessment of the group over 40 years old, with $M = 2.60$ (with $p = 0.000^*$). In terms of administrative reform, it seems that the group over 40 years old with knowledge and skills in administrative reform is significantly superior with $M = 3.20$ compared to the group under 40 with $M = 2.54$ (with $p = 0.000^*$). In terms of demographics by age variable, there is a statistically significant difference in both digital transformation and administrative reform. Research results on digital transformation and administrative reform by education level variable are shown in Table 6:

Table 6. Digital transformation and administrative reform under education variables

Administrative Reform	Education	Mean	SD	Test	P-value
Society	Higher Education	3.41	0.81	T-test	0.128
	Postgraduate	3.67	0.87		
Technology	Higher Education	2.46	1.26	T-test	0.02*
	Postgraduate	3.28	0.84		
Organization	Higher Education	3.09	0.79	T-test	0.081
	Postgraduate	3.27	0.75		
Reform of Administrative Procedures	Higher Education	4.02	0.88	T-test	0.474
	Postgraduate	4.08	1.06		
Organizational Reform	Higher Education	2.75	0.87	T-test	0.426
	Postgraduate	2.97	0.77		
Competency Building Of Civil Officer	Higher Education	3.23	0.95	T-test	0.757
	Postgraduate	3.25	1.17		

*Correlation is statistically significant at level 0.05.

The research results show evidence of a statistically significant difference ($p=0.03^*$) in digital transformation in terms of technology, with the assessment of the Postgraduate group $M=3.28$ while the Higher Education group $M=2.46$. Social and organizational aspects of digital transformation have no statistically significant difference. Moreover, the remaining assessments have no difference, mean $p \geq 0.05$. Thus, demographic statistics by education variable at both Higher Education and Postgraduate make almost no difference in digital transformation implementation except for technology and administrative reform. The level of education makes a significant difference in the perception of technology. It is not in the social aspect, the organizational aspect as well as the administrative reform issue.

Table 7. Digital transformation and administrative reform under job position variables

Administrative Reform	Job position	Mean	SD	Test	P-value
Society	Leader	3.85	1.07	T-test	0.001**
	Staff	3.23	0.83		
Technology	Leader	2.96	0.96	T-test	0.002**
	Staff	2.78	1.15		
Organization	Leader	3.52	0.67	T-test	0.04*
	Staff	2.84	0.82		
Reform of Administrative Procedures	Leader	4.42	0.86	T-test	0.000**
	Staff	3.68	1.09		
Organizational Reform	Leader	3.27	0.74	T-test	0.000**
	Staff	2.45	0.93		
Competency Building of Civil Officer	Leader	3.67	0.81	T-test	0.03*
	Staff	2.81	1.33		

* Correlation is statistically significant at level 0.05; **Correlation is statistically significant at level 0.01.

The T-test shows that there is a statistically significant difference in the variables of digital transformation as well as administrative reform. The highest results of digital transformation are in society and technology ($p \leq 0.01$). And for administrative reform are administrative procedure reform and administrative reform at the same level of significance ($p \leq 0.01$). Both digital transformation in the organization and administrative reform in building and improving the quality of civil officers the difference are statistically significant, with $p \leq 0.05$. It can be seen that there is a statistically significant difference in the assessments of leaders and employees in digital transformation and administrative reform. However, current results also show that even civil officers don't have high knowledge and skills in the digital transformation of leaders in Vietnam [16]. Therefore, to promote digital transformation, it is necessary to report to the digital leader; along with that, the staff must also have an understanding of digital technology, digital transformation, and the most significant shortage in both leaders and employees in the context of digital transformation are the shortage of information technology skills [30]. The results of the survey of the opinions of the subjects about the training major were carried out (Table 8).

Table 8. Digital transformation and administrative reform under Subject Field variables (N=321)

Administrative Reform	Subject Field	Mean	SD	Test	P-value
Society	Humanities and Social Sciences	3.35	0.85	T-test	0.04*
	Natural and Applied Sciences	3.73	0.77		
Technology	Humanities and Social Sciences	2.66	1.14	T-test	0.01**
	Natural and Applied Sciences	3.08	0.90		
Organization	Humanities and Social Sciences	3.01	0.82	T-test	0.04*
	Natural and Applied Sciences	3.35	0.97		
Reform of Administrative Procedures	Humanities and Social Sciences	3.97	0.84	T-test	0.073
	Natural and Applied Sciences	4.13	1.03		
Organizational Reform	Humanities and Social Sciences	2.81	0.91	T-test	0.182
	Natural and Applied Sciences	2.91	0.78		
Competency Building Of Civil Officer	Humanities and Social Sciences	3.04	1.05	T-test	0.04*
	Natural and Applied Sciences	3.44	0.93		

*Correlation is statistically significant at level 0.05; **Correlation is statistically significant at level 0.01.

The parameter T-test shows that there is a statistically significant difference between the two groups of industries in which civil officers are trained during their higher education or Postgraduate. Regarding digital transformation in terms of social aspect with $p = 0.04^*$, technology $p = 0.01^*$, and in organizational $p = 0.04^*$. Regarding administrative reform, the aspect of organizational reform of the administrative apparatus, the difference between humanities and social sciences and natural and applied sciences, with $p = 0.182 > 0.05$, and the difference in administrative procedure reform between humanities and social sciences and natural and applied sciences groups with $p = 0.073 > 0.05$. The difference here is not statistically significant. However, in terms of building and improving the quality of civil officers, the

difference between the two groups of subject fields in humanities and social sciences and natural and applied sciences is significant, with $p = 0.04^* < 0.05$. Such a difference may be one of the reasons for the uniformity in perception among trained majors, and there may be different views on the impacts of the digital transformation process on improving the quality of life administration with positive results. The difference in demographics according to the variable of work between civil officers and citizens has been considered to evaluate the objectivity of the opinions of civil officers with the views of the citizens in order to have a Scientific basis and practical basis to confirm the impacts of digital transformation on administrative reform taking place in provincial administrative agencies of Vietnam (Table 9).

Table 9. Digital transformation and administrative reform under Scope of work variables

Administrative Reform	Scope of work	Mean	SD	Test	P-value
Society	Citizen	3.12	0.87	T-test	0.000**
	Civil officers	3.96	0.79		
Technology	Citizen	2.69	1.16	T-test	0.03*
	Civil officers	3.05	0.92		
Organization	Citizen	2.82	0.86	T-test	0.000**
	Civil officers	3.54	1.08		
Reform of Administrative Procedures	Citizen	3.64	0.84	T-test	0.000**
	Civil officers	4.46	0.76		
Organizational Reform	Citizen	2.59	0.86	T-test	0.000**
	Civil officers	3.13	0.75		
Competency Building Of Civil Officer	Citizen	2.83	0.98	T-test	0.000**
	Civil officers	3.65	0.85		

*Correlation is statistically significant at level 0.05; **Correlation is statistically significant at level 0.01.

The t-test of two groups of people, citizens, and civil officers, shows that the observations on digital transformation in three aspects of society, technology, and organization are statistically significant ($p = 0.000^{**}$, 0.03^* , and 0.000^{***}), respectively. The highest difference is the social aspect and the organizational aspect, which is consistent with the view of the Government of Vietnam during the period as a strong direction towards implementing digital transformation [30]. On the other hand, in terms of technology, there are many respondents in the private sector, which has recently been quite sensitive in digital transformation, so the difference is not high, even in the strategy of the private sector. The Vietnamese Government gradually allows the private sector to access and participate in the operation of technical infrastructure in administrative agencies [6] so shortly; likely, digital transformation in public and private sectors is not statistically significant. ($p > 0.05$).

Table 10. Correlation between Digital Transformation and Administrative Reform

Digital Transformation and Administrative Reform	M	SD	r
Digital Transformation	3.197	0.875	0.76**
Administrative Reform	3.383	0.858	

*Coefficient correlation Pearson; **Correlation is statistically significant at level 0.01.

Provincial administrative reform in Vietnam is taking place popularly, but unevenly, mainly focusing on administrative reform in public services, so the evaluation result is only with $M=3,383$, which is not significantly superior compared with the numerical conversion rating $M=3.197$. The results of digital transformation and administrative reform are not outstanding. Although the digital transformation is interesting, the biggest limitation currently is the digital skills and digital leadership capacity of public servants in administrative agencies. Provincial governments in Vietnam have not yet met the requirements of digital transformation [15]. On the other hand, administrative reform has not yet shown the requirements and objectives that the Government of Vietnam has set [22]. However, the reality and determination of provincial administrative agencies in the digital transformation strategy have had strong and profound impacts on administrative reform. It is shown by the correlation with $r = 0.76^{**}$ ($p < 0.01$), the correlation results are statistically significant, there is a basis to confirm that digital transformation has a profound impact on administrative reform at the level province of Vietnam.

4.4. Forecasting the Impact Trend of Digital Transformation on Administrative Reform

The results in Table 11 show that when the social aspect in digital transformation increases by one unit, administrative reform will increase by 1.07 units, and the regression line is relatively narrow, with $B = 0.168$, coefficient $\beta = 0.147$, $t = 4.19$. This effect has very strong statistical significance, with $p = 0.00^{**} < 0.01$. In terms of technology, when digital technology increases by 1 unit, administrative procedure reform will increase by 1.13 units, the regression line has no dispersion, $B = 0.356$, coefficient $\beta = 0.316$, $t = 3.85$. This result shows that the impact of technology aspect on administrative procedure reform has very strong statistical significance, with $p = 0.00^{**} < 0.01$. Finally, the organizational aspect increased by 1 unit, the administrative reform increased by 0.98 units, which explains the relatively narrow regression curve and the denormalized beta coefficient $B = 0.321$, the coefficient $\beta = 0.283$, $t = 3.77$. This effect has very strong statistical significance, with $p = 0.00^{**} < 0.01$.

Table 11. Regression results on the impact of digital transformation on administrative procedure reform

Predictors	B	Unstandardized B coefficient	Standardized β coefficient	t	Significance (p-value)
Society	1.07	0.168	0.147	4.19	0.00**
Technology	1.13	0.356	0.316	3.85	0.00**
Organization	0.98	0.321	0.283	3.77	0.00**

**Correlation is statistically significant at level 0.01.

The results in Table 12 show that, when the social aspect increases by 1 unit, the administrative apparatus organization increases by 1.97 units, the unnormalized beta coefficient $B = 0.392$, the standardized beta coefficient $\beta = 0.387$. The coefficient $t = 3.83$ is significant ($t > 1.96$), this effect is statistically significant with $p = 0.00^{**} < 0.01$. The technological aspect increased by 1 unit, the organization of the state administrative apparatus increased by 2.03 units, the unstandardized beta coefficient $B = 0.505$, the standardized beta coefficient $\beta = 0.229$, the coefficient $t = 3.91$ is statistically significant ($t > 1.96$), significance level with $p = 0.00^{**} < 0.01$. The organizational aspect increased by 1 unit, the reform of the state apparatus increased by 1.58 units. This result explains for unnormalized beta coefficient $B = 0.237$, normalized beta coefficient $\beta = 0.361$, coefficient $t = 4.25$, this effect is statistically significant with $p = 0.00^{**} < 0.01$.

Table 12. Regression results in the impact of digital transformation on organizational reform of the state administrative apparatus

Predictors	B	Unstandardized B coefficient	Standardized β coefficient	t	Significance (p-value)
Society	1.97	0.392	0.387	3.83	0.00**
Technology	2.03	0.505	0.229	3.91	0.00**
Organization	1.58	0.237	0.361	4.25	0.00**

**Correlation is statistically significant at level 0.01.

The forecast results in Table 13 show that when the social aspect increases by 1 unit, the construction and improvement of the quality of civil service activities of civil servants increases to 1.26 units, the unnormalized beta coefficient $B = 0.547$, normalized beta coefficient $\beta = 0.348$, t value = 3.64, significance level $p = 0.00^{**} < 0.01$. The technological aspect increases by 1 unit, the quality of civil service activities of civil servants will increase by 0.98 units, unnormalized beta coefficient $B = 0.192$, standardized beta coefficient $\beta = 0.322$, coefficient $t = 4.17$, p -value = $0.00^{**} < 0.01$. In the aspect of the organization increased by 1 unit, the quality of civil service activities of civil servants increased by 1.42 units, which explains the unnormalized beta coefficient $B = 0.325$, standardized beta coefficient $\beta = 0.256$, $t = 3.80$, p -value = $0.00^{**} < 0.01$. Thus, the impact of digital transformation on society, technology, and organization is statistically significant. The results predict that digital transformation will be a smart solution for provincial administrative agencies in Vietnam to improve administrative reform efficiency.

Table 13. Regression results in the impact of digital transformation on the construction and improvement of the quality of civil service activities of civil officers

Predictors	B	Unstandardized B coefficient	Standardized β coefficient	t	Significance (p-value)
Society	1.26	0.547	0.348	3.64	0.00**
Technology	0.98	0.192	0.322	4.17	0.00**
Organization	1.42	0.325	0.256	3.80	0.00**

**Correlation is statistically significant at level 0.01.

5. Conclusions

Digital transformation has become a popular topic that the Government of Vietnam acknowledges and is interested in. The Government also urges administrative agencies to implement digital transformation strategies. Especially in the context of social distancing, the contact between people and administrative agencies as well as between administrative agencies and civil officers in law enforcement public service activities are not easy to do. In the second half of 2021, when the Covid-19 pandemic is raging, the effectiveness of the transformation becomes even more urgent for administrative reform. And the reality has proven that digital transformation is an irresistible trend, so Vietnam's provincial administrative agencies have taken positive steps to realize the Government's direction. Digital transformation has been applied in public service implementation and has produced many positive results.

However, the big obstacle that is posed for the successful digital transformation in Vietnam is that the contingent of civil servants is not ready for the digital transformation process. In all three aspects, the aspect, the technology, and the organization of digital transformation have not achieved many achievements in promoting socio-economic development. Some studies have shown that the limitation is due to the lack of digital skills by civil officers and the lack of digital leadership skills by leaders, and this study, through the evaluation opinions of civil servants, shows that there is still a difference in perception within the civil servant himself as the subject of public service. Therefore, the application of digital transformation to administrative reform at present, which this study shows, has not brought many positive results. Moreover, people as beneficiaries of administrative reform, but between citizens and civil servants, there is a very clear difference in perception, because there is not enough information to know exactly about the target. To what extent have the results of digital transformation been applied to administrative reform. Therefore, there is no interaction between people and administrative agencies in this process, so when digital transformation is put into operation, people will face many difficulties when communicating with administrative agencies on the advanced technology platform.

This study shows that the digital transformation in Vietnam's provincial administrative agencies has not yet achieved many impressive results, but this is being actively implemented with great potential with a very strong direction from the Government, so the correlations between digital transformation and administrative reform are quite close. Forecasted results on all three aspects of administrative reform, namely administrative procedure reform, state administrative reform, and improvement of the quality of civil service activities of civil servants, are all affected by digital transformation in all three aspects: society, technology, and organization. This means that the effectiveness of administrative reform depends greatly on the results of digital transformation.

6. Declarations

6.1. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.2. Funding

The author received no financial support for the research, authorship, and/or publication of this article.

6.3. Ethical Approval

Participants gave their written consent to use their anonymous data for statistical purposes. All of them were over 18 years old and voluntarily collaborated without receiving any financial compensation.

6.4. Declaration of Competing Interest

The author declare that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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