

To cite this article: Luu Thi Thanh Mai, Dang Thanh Liem and Trinh Xuan Hoan (2022). FACTORS AFFECTING THE DIGITAL TRANSFORMATION OF TELECOMMUNICATION ENTERPRISES IN HO CHI MINH CITY, International Journal of Applied Science and Engineering Review (IJASER) 3 (3): 59-74

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## **FACTORS AFFECTING THE DIGITAL TRANSFORMATION OF TELECOMMUNICATION ENTERPRISES IN HO CHI MINH CITY**

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DOI: <http://dx.doi.org/10.52267/IJASER.2022.3308>

### **ABSTRACT**

The study focuses on the factors influencing the digital transformation (DT) process of telecommunication enterprises in Ho Chi Minh city. The paper concludes on five factors including Leadership, Human Resources, Technology, Workflow and Business Strategy. The research scale is built from 25 independent observed variables, five dependent observed variables and 300 research samples. The linear regression model indicates that the independent factors do influence the dependent factors with a relevance level of 63.9%. The regression model with five factors is proposed through statistical tests and proves its utilization for the study.

**KEYWORDS:** Digital transformation, Digitizing, Digital technology, Technology Revolution, Information Technology.

### **1. INTRODUCTION**

The Industrial Revolution 4.0 with a focus on DT creates opportunities for countries, businesses and individuals to step into the starting line of the digitization race with many challenges to overcome ahead. On the other hand, the crisis from the COVID-19 pandemic has also normalized digital presence. According to the annual report of the Department of E-commerce and Digital Economy conducted by the Ministry of Industry and Trade of Vietnam in 2021, industries that accommodate digitization in their operations are hospitality (95%), finance (93%), healthcare (92%), education (89%), technology (88%), manufacturing (87%), retail (86%) and government (82%). It can be seen that digitization goes into all industries and fields of society and is an indispensable element.

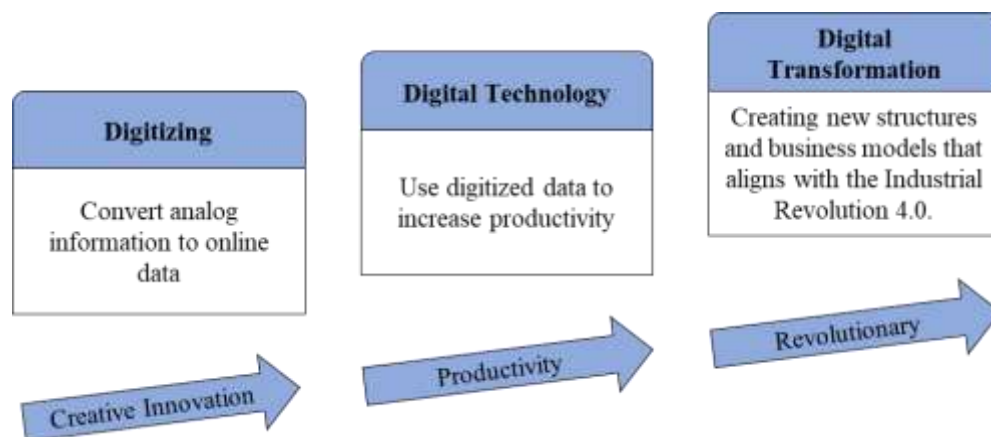
A digital transformation is no longer an option, but a mandatory element that assists businesses in overcoming difficulties. However, businesses need to be able to justify their digitization decision by identifying and focusing on the factors with a significant impact on the process. Vietnam Posts and Telecommunications Group (VNPT) branch in Ho Chi Minh City is the main provider of communications and information technology services in the city. Following the trend of development and integration, the communications industry has gradually deviated from its monopoly position, lower entry barriers and higher competitive situation. Thus, digital transformation is the new factor that helps increase profit margin in this sector.

In Vietnam, the Party and Government have led and directed all levels and sectors to promote the research and application of science and technology, adopt and participate in the Fourth Industrial Revolution, including content of digital transformation through regulatory documents such as Directive 16/CT-TTg in 2017 [1], Resolution No. 52-NQ/TW in 2019 [2], Resolution No.55-NQ/TW in 2020 [3].

According to Ismail, Khater and Zaki (2017), DT refers to the social and economic impacts of digitizing data and processes. Data digitization is the conversion of data and automatic processes into a machine-readable format. The process involves connecting technology and data to create added value for the operational chain [4].

To clarify the stages of DT, Siebel (2019) points out the problem of distinguishing the difference between digitization, digitalization and digital transformation [5], as shown in Figure 1:

- Digitization is the creation of input data from real information in a traditional form such as going from analog to digital promote innovations.
- Digitalization is the use of digital data to process data faster and more efficiently. Matzler et al. (2016) consider the role of this stage as the process of using digitized data to improve operational processes [6].
- Digital transformation is the use of digital technology on the basis of digitized data to transform research models, production processes or business operations to create added value, and improve operational efficiency and competitiveness of the organization, agency and enterprises.

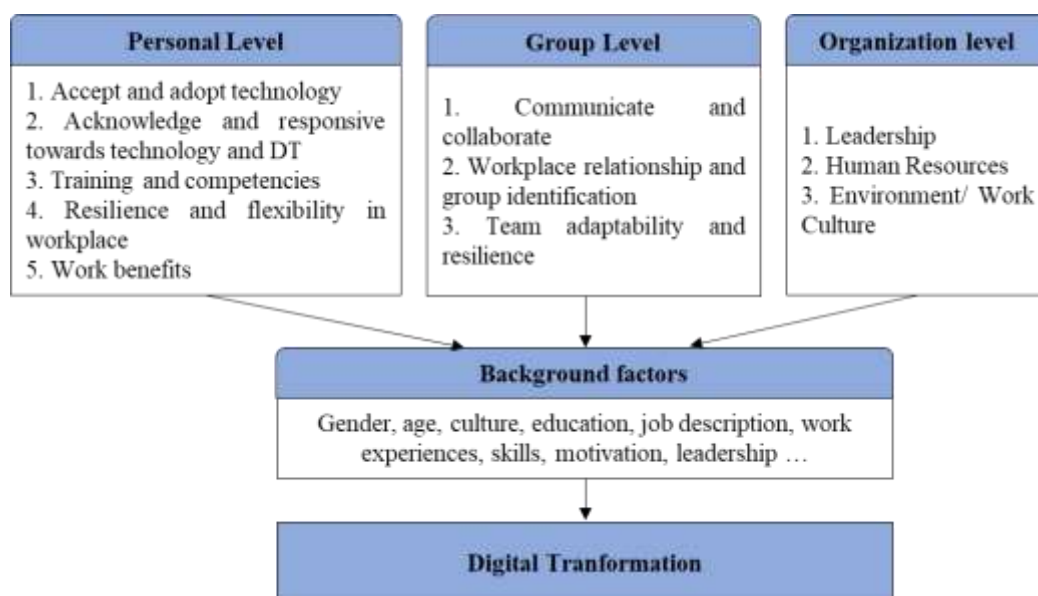


Source: Siebel, 2019

**Figure 1: Digitization, Digitalization and Digital Transformation**

The foundation of all three phases is information technology.

In their study, Trenerry et al (2021) identified multiple factors that are imperative for DT in the workplace and presented them in a multi-level model, including individual, group and organization levels (Figure 2). According to this model, there are specific factors at each level, however, in the context of DT, the authors consider (i) a well-defined long-term business strategy. (ii) leadership, (iii) human resources, and (iv) availability of technology are the key factors determining the success of digital transformation as well as the situation of the business [7].



Source: Trenerry et al (2021)

**Figure 2: Multi-level model of digital transformation factors**

According to McKinsey survey in 2020, a successful digital transformation requires (i) well-defined digitization goals, (ii) a suitable approach and implementation, (iii) knowledgeable leadership and (iv) a supporting external environment.

While technology is important, a clear goal is far more imperative to the success of the digitization process. There is evidence of enterprises that achieve successful transformation process due to step-by-step goals instead of new technologies.

DT requires building a strategy with a long-term vision that comes from leadership skills. If the leading team is ignorant or over-cautious, DT is unlikely to succeed from missing out on opportunities. Hence, the leadership team must clearly define the goals and stages of the process to plan all necessary steps for the implementation step. On the other hand, the external environment needs to be observed and analyzed by business leaders to update and make adjustments according to such uncontrollable and unpredictable factors. Analysis of the external environment helps organizations mitigate risks by forecasting potential risks to come up with solutions for different scenarios.

According to Clark (2019), for DT to be successful, there are four factors: (i) workflow, (ii) human resources, (iii) online business operation and (iv) adaptability [9].

In this case, repetitive work is more suitable for the digitization process, for which the business utilizes the automation feature of technology. Activities that require customization and modification pose more problems for the transformation.

The second factor is human resources which cover all strategic, operational and third-party resources. Essentially, digital transformation is a process to help people and is implemented by people instead of technology. Hence, the process starts with human capital that proposes solutions and technology that assists with the workflow.

The third factor is utilizing Internet to normalize and mainstream the use of digital processes and services.

The fourth factor is flexibility – the ability to adjust and adapt to different situations instead of a rigid one-size-fits-all model.

According to Morgan (2020), there are eleven factors influencing the success of DT in the business [10], including:

- Customer: DT must be customer-oriented to satisfy their needs.
- Organizational structure: If the business fails to create a data-sharing mechanism, it will stop at the level of the digitization process;
- Managing changes in the enterprise: One of the main obstacles of many businesses in DT stems from the rigid procedure that refuses to adapt and modify, even from the leadership level;
- Business leader: leader's intentions to innovate;
- Technology: Available technology offers businesses options to promote the digitalization process;
- Data integration: Data comes from many sources from partners, customers, stakeholders or within the businesses. Data integration helps reduce the digitization process and increase efficiency;
- Logistics and supply chain: DT aids the control of logistics and delivery to customers;
- Data security: DT requires data security for business and customer protection;
- Product development: Innovative and functional products and services have a direct impact on the business;
- Data digitization and process digitization: the extent to which data is digitized affects the transformation process;
- Personalization: DT must be able to add customization input and enhance the personal experience for the customer.

Using the Technology-Organization-Environment analytical framework, Chu Ba Quyet and Hoang Cao Cuong (2020) have researched factors affecting the decision to apply ERP to small businesses in Vietnam [11]. The authors divide the affecting factors into three groups:

- Technology (T) includes digital process, information safety and security, availability of information technology and data infrastructure.
- Operation (O) includes strategy, human capital, business processes and organizational structure.
- Environment (E) includes customer choice, logistics, customer support and government support.

Bui Thi Quyen and Pham Nhat Linh (2020) have conducted research that investigates solutions to promote DT for the private capital postal sector. Based on the analysis of the digital transformation activities in private postal businesses, the research has proposed many solutions such as improving financial capacity, training high-quality human resources, establishing a postal association or setting digitization achievements.

Through the process of synthesizing and studying relevant documents both local and global, the author finds a number of factors affecting the digitization process in technology enterprises such as:

- Leadership
- Human resources
- Technology
- Workflow
- Business strategy

In which, no digital transformation research has targeted the process in Vietnamese telecommunication enterprises. This paper, hence, attempts to fill in that research gap.

## **2. METHODOLOGY**

The study used a quantitative research method with a survey of 300 samples who are leaders of branches, board of directors, experienced department heads and key employees in the telecommunication sector.

The author chooses the non-probability sample approach that is suitable for its accessibility, time and cost-saving.

The study chooses the form of email survey and direct questionnaires and interviews via Google docs with the assistance of colleagues to distribute the surveys.

The official scale collects more information about the survey respondents' demographics, including gender, age and education level. Information about such type of data is used for ANOVA analysis of variance to test the difference between gender, age and education groups of survey subjects.

Based on the official scale of 25 observed variables of five independent factors, five observed variables of dependent factors and three demographic factors. The scale officially undergoes quantitative analysis techniques such as Cronbach's Alpha reliability assessment and exploratory factor analysis (EFA) and regression analysis.

All analysis results were performed with the support of statistical software SPSS version 22.0.

### 3. RESULT AND DISCUSSION

#### 3.1. Sample Descriptive Statistics

All descriptive statistics about the survey sample are presented in Table 1.

**Table 1: Sample Descriptive Statistics**

Sample		Frequency	Percentage (%)	Accumulation (%)
Gender	Male	165	55.0	55.0
	Female	135	45.0	100.0
	Total	300	100.0	
Age	Under 25	71	23.7	23.7
	From 26 to 35	114	38.0	61.7
	From 36 to 45	90	30.0	91.7
	Above 46	25	8.3	100.0
	Tổng	300	100.0	
Education	College	29	9.7	9.7
	Undergraduate	231	77.0	86.7
	PhD.	40	13.3	100.0
	Total	300	100.0	

Source: Author (2020)

#### 3.2. Assess the Reliability of the Scale

Analyze the reliability of the scale using Cronbach's Alpha coefficient to remove variables that do not fit in the model. Variables with variable-total correlation coefficient less than 0.4 and scale components with Cronbach's Alpha coefficient less than 0.6 will be excluded from the model.

Cronbach's Alpha of 0.6 or higher is an acceptable scale of reliability (Hoang Trong, Chu Nguyen Mong Ngoc, 2018 [13]).

The results of the scale reliability assessment show that all the scales and observed variables meet the requirements for reliability (Table 2) so they will be retained and analyzed in the next step.

**Table 2: Results on evaluating the reliability of scale**

Cronbach's Alpha coefficient of the Leadership scale (LD): 0.794		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LD01	Digital transformation received support from major owners.	0.574	0.754
LD02	Branch leaders are knowledgeable about digital transformation.	0.537	0.766
LD03	Active Digital Transformation Executives.	0.691	0.718
LD04	Well-thought implementation plan.	0.432	0.802
LD05	Well-defined goal and test for plan review and assessment.	0.657	0.728
Cronbach's Alpha coefficient of the Human Resource scale (NL): 0.935		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
NL06	Employees are trained in digital transformation.	0.854	0.914
NL07	Employees understand the business's digital transformation strategy.	0.858	0.913
NL08	Employees are doing digital transformation of the business.	0.667	0.949
NL09	Complementary skills and knowledge to promote digital transformation.	0.897	0.906
NL10	Competent workforce to execute digital transformation strategies.	0.864	0.913
Cronbach's Alpha coefficient of the Technology scale (CN): 0.885		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted



CN11	The application of technology helps information and data be processed accurately.	0.634	0.880
CN12	The application of technology helps to prevent information and data from being misused or abused.	0.766	0.849
CN13	The application of technology helps keep information and business data secure.	0.698	0.866
CN14	Technologies applied at enterprises are suitable for digital transformation requirements.	0.783	0.846
CN15	Enterprises plan to continue to invest and update technology for the purpose of digital transformation.	0.738	0.857
Cronbach's Alpha coefficient of the Work Process scale (QT): 0.792		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
QT16	The use of computers and internet for work processes.	0.546	0.761
QT17	Jobs built and put on the internet.	0.551	0.760
QT18	Reduced manual work.	0.620	0.737
QT19	Divisions are structured to suit the business's digital transformation.	0.495	0.778
QT20	Flexible organizational workflows for digital transformation.	0.651	0.727
Cronbach's Alpha coefficient of the Business Strategy scale (CL): 0.808		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CL21	Enterprises aim to optimize customer experience on digital platforms.	0.684	0.741
CL22	Enterprises towards digital transformation of business models.	0.590	0.772
CL23	The enterprise's digital transformation strategy has been implemented.	0.489	0.802

CL24	Digital transformation strategy in line with the overall strategy of the business.	0.554	0.782
CL25	Digital transformation strategy is well-explained and understood for implementation.	0.657	0.751
Cronbach's Alpha coefficient of the Digital Transformation scale at VNPT HCM (CDS): 0.932		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CDS26	Customers appreciate your digital products and services.	0.762	0.927
CDS27	Customers continue to use digital products and services of the business in the future.	0.804	0.919
CDS28	Digital transformation benefits corporate employees.	0.782	0.924
CDS29	Digital transformation helps with business's growth.	0.876	0.905
CDS30	Leaders are satisfied with the business' digital transformation activities.	0.877	0.905

Source: Author (2022)

### 3.3. Exploratory factor analysis of the scale

Analysis of the scale of independent factors

The results of the KMO test of the official independent factors reached the value of 0.847 and the Bartlett test reached the value of 0.000 indicate an appropriate factor. The total variance extracted of 64.452% extracted from five factors. The results of factor analysis (rotation) shows that all factor loading coefficients are greater than 0.5 and the observed variables are grouped as the original scale division. Hence, there are no changes to the scale and components, which has met the test requirements (Table 3).

**Table 3: Analysis of the scale of independent factors**

Variables	Factors				
	NL	CN	QT	LD	CL
NL09	0.908				
NL06	0.894				
NL07	0.887				
NL10	0.879				
NL08	0.712				
CN14		0.847			
CN12		0.841			
CN13		0.794			
CN15		0.776			
CN11		0.716			
QT20			0.795		
QT18			0.736		
QT16			0.710		
QT17			0.705		
QT19			0.580		
LD03				0.814	
LD05				0.766	
LD01				0.711	
LD02				0.680	
LD04				0.561	
CL21					0.837

CL22					0.759
CL25					0.759
CL23					0.562
CL24					0.556
Variance Quoted (%)	16.025	30.054	41.798	53.198	64.452
KMO Coefficient	0.847				
Bartlett's test (Sig.)	0.000				

Source: Author (2022)

*Analysis of the scale of dependent factor*

The results of analysis of the scale of dependent factor presented in Table 4.

**Table 4: Analysis of the scale of dependent factor**

Variables	Factor
	CDS
CDS29	0.926
CDS30	0.926
CDS27	0.878
CDS28	0.860
CDS26	0.844
Variance Quoted (%)	78.752
KMO Coefficient	0.893
Bartlett's test (Sig.)	0.000

Source: Author (2022)

Given the result of satisfying observed variables and formal scales, five independent factors and digital transformation dependent factors are kept for the linear regression model.

**3.4. Analysis of linear regression model**

The results of the linear regression analysis show that all five independent factors have a significant impact on the DT-dependent factors (with Sig value < 0.05, at a 1% significance level). Regression coefficient  $\beta$  for the Human Resources NL, Technology CN, Workflow QT, Leadership LD and Business Strategy CL are 0.454, 0.256, 0.135, 0.556 and 0.214 respectively (Table 5). In which, the original constant has no regression significance with the Sig value > 0.05.

**Table 5: Analysis results of the linear regression model**

Factor	Unnormalized coefficients		Normalization coefficient	t	Sig.	Multicollinear Statistics	
	B	Standard Deviation	Beta			Tolerance	VIF
(Constant)	1.9E-17	.035		.000	1.000		
NL	.454	.035	.454	13.057	.000	1.000	1.000
CN	.256	.035	.256	7.377	.000	1.000	1.000
QT	.135	.035	.135	3.876	.000	1.000	1.000
LD	.556	.035	.556	16.007	.000	1.000	1.000
CL	.214	.035	.214	6.170	.000	1.000	1.000

Source: Author (2022)

Regression analysis shows that the impact level of the independent factors is statistically significant from large to small as follows – leadership, Human Resources, Technology, Business Strategy and Workflow with a relevance level of 63.9%. The regression model passed the statistical tests and proved its relevance to the study.

The results of ANOVA analysis of variance for the components of sex, age and education level did not detect any difference between the groups of components for the DT process at VNPT HCM. Based on the above analysis result, the author proposes some managerial implications as follows: Firstly, for leaders at VNPT HCM, whether DT is successful or not depends greatly on the leadership's need to regularly update necessary knowledge and skills. Cortellazzo et al (2019)

identified five key skills that characterize effective leadership in the digital era are media communication, rapid decision making, problem management, adaptability and technical skills [14]. In a high-tech environment, the agile leadership style is found to be more effective than transactional and liberal leadership. In other words, leaders must provide resources and implement structural changes to support digital transformation strategic efforts.

Secondly, for human resources at VNPT HCM. To level up the current attempt to raise awareness for DT activities, VNPT HCM must pay attention to the introduction of new technologies, data digitization activities and processes to assist employees. This is the most important tool to accelerate the transition process to a digitized procedure. In terms of skills and training, an individual's ability to acquire new skills and respond to new information is a focus element for telecommunication enterprises.

Thirdly, for technology at VNPT HCM. Each technology has its use and application to make people's lives easier. Hence, VNPT HCM has a basis to deploy new technology to increase productivity. Some of the useful tools would be smartphones, IoT, Cloud computing, big data and analytics, social networks.

Fourth, for business strategy in VNPT HCM, businesses need to figure out solutions to apply the multilevel DT model. The strategy needs to be automated, flexible while on alert to avoid failing knives. For example, business can conduct integration of SMART strategic policy framework and change corporate culture that lean towards decentralization.

Finally, for workflow at VNPT HCM. Teamwork and collaboration between departments are essential to organizational performance and the quality of teamwork products. Clear roles and responsibilities of senior leadership, strategies for providing constructive feedback, bottom-up workflow improvements such as employees' team engagement and goal dedication.

#### **4. CONCLUSION**

By using quantitative research method, along with interviewing and survey techniques by questionnaire, the research has identified the factors affecting the digital transformation process at VNPT HCM, including Leadership, Human resources, Technology, Business Strategy and Workflow.

Next, assess the impact of the above factors on the digital transformation at VNPT HCM, specifically, the Leadership factor has the greatest impact with a regression coefficient of 0.556. This is followed

by Human resources as the second one with 0.454; third place falls on technology with the coefficient of 0.256, the fourth is Business Strategy with the coefficient factor of 0.214 and the last is the Workflow factor with the coefficient of 0.135.

Based on these research results, governance implications for improving the efficiency of digital transformation process at VNPT HCM are proposed for the leadership team, human resources, business strategy and workflow.

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