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# Improve the Quality of Human Resources to Meets the Requirements of Digital Transformation in Vietnam

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## Abstract

The fourth industrial revolution has opened up the trend of digital transformation in most countries around the world and Vietnam is also in that general trend. Digital transformation in the economy brings development opportunities for organizations and businesses, but at the same time requires adequate human resources with appropriate capabilities in the digital transformation process. The article aims to evaluate the current status of the quality of human resources in Vietnam during the digital transformation period and propose some solutions to improve the quality of human resources to meet the requirements of digital transformation in Vietnam.

**Keywords:** Digital Transformation, Human Resource Quality

## 1. Introduce

Digital transformation takes place in most countries around the world and is present in all areas of socio-economic life, by applying new technologies such as Big Data, Internet of Things (IoT), and computing. Cloud, blockchain, and artificial intelligence... have created fundamental changes in the management and operation methods of government agencies, businesses, and fields and created great value. Much better than previous production methods. According to Brooks & McCormack (2020) [19], digital transformation is a series of transformations in technology, people, and profound organizational culture, creating new operating models, and transforming operations, strategic directions, and organizational values.

With the continuous development and great benefits brought by digital transformation, on September 27, 2019, Politburo issued Resolution No. 52-NQ/TW on several guidelines and policies to proactively participate in digital transformation. Join the Fourth Technological Revolution. Implementing the Politburo's policy, on June 3, 2020, the Prime Minister signed Decision No. 749/QD-TTg approving the National Digital Transformation Program until 2025, with a vision to 2030. The dual goal is to develop the digital government, digital economy, and digital society, and form Vietnamese digital technology businesses that can go global. The goal is that by 2025, Vietnam's digital economy will account for 20% of GDP, and by 2030, this number will be 30% of GDP. To achieve this goal, great efforts are needed, because currently Vietnam's digital economy is Vietnam has only reached about 8%. The problem is that for digital transformation to be successful, resources for digital transformation are very important. Besides material resources, human resources play a key and decisive role, while the quality of Vietnam's human resources is still limited. Therefore, the article focuses on researching improving the quality of human resources to meet the requirements of digital transformation in Vietnam.

## 2. Theoretical basis of the research
### 2.1 Concept
#### 2.1.1 Human Resources
Chu Tien Quang and colleagues (2005) [11] said that "Human resources include the quantity and quality of the population and workers who are prepared to a certain extent, ready to be mobilized into the development process." Socioeconomic". In a broad approach, human resources in this concept are all human resources including people of working age and people outside of working age; In the narrow approach, human resources are limited to people of working age; At the same time, this concept emphasizes the quality of labor, that is, labor must have the working capacity to participate in economic activities.

Meanwhile, Tran Xuan Cau and Mai Quoc Chanh (2012) [3] stated "Human resources are human resources, an important part of the population, playing a role in creating material and spiritual wealth for society.". Depending on the approach, the concept of human resources may be different, therefore, the scale of human resources is also different.

Thus, synthesizing the above approaches, human resources are people who are currently working and will be working in the future (including people who are in school, and do not need a job, or support...), must have an age from the lower limit of working age or older to have enough cognitive capacity, creative capacity, qualifications, and health.

Also referring to the quality of each person, Begg *et al.* (1995) said that "Human resources are understood as all the professional qualifications that people have accumulated, capable of bringing income in the future". Vu Thi Ngoc Phung believes that "Human resources quality is assessed by the education level, expertise and skills of workers as well as their health". According to this point of view, the quality of human resources is evaluated through the following criteria: educational level, expertise and skills (mental capacity), and health (physical strength). These criteria are quantified by educational levels and professional training levels that are available and can be measured relatively easily. Mai Quoc Chanh (2000) [4] gives the definition "Human resources quality is considered in terms of health level, cultural level, professional level, capacity, and quality". Thus, it can be seen that the quality of human resources represents the relationship between the constituent elements, including physical strength, mental strength, and spiritual strength of human resources.

### 2.1.2 Digital conversion

There are many different definitions of digital transformation, such as Westerman, G. *et al.* (2011) [25] say that digital transformation is the use of technology to radically improve the performance or reach of a business. Fitzgerald, M. *et al* (2013) [20], define digital transformation as using new digital technologies to create significant business improvements such as enhancing customer experience, streamlining operations production and business activities, or creating new business models. Vial (2019) [23] identifies digital transformation as a process that aims to develop an entity by creating significant changes in its attributes through the combination of information, computers, communication, and technology. Connect.

The understanding of digital transformation may be different, but they all have the same aspects in common: using digital technology in organizational activities; changing the way organizations manage and operate, and creating new, higher values for organizations and customers (Nguyen Thi Tu Quyen, 2019) [13].

### 2.2 Objectives and requirements for human resource quality to meet digital transformation requirements

Along with the digital transformation process, there is a need for human resources to meet the requirements of digital transformation. On January 28, 2022, Deputy Prime Minister Vu Duc Dam also signed Decision No. 146/QD-TTg approving the Project "Raising awareness, universalizing skills and developing human resources for digital transformation in countries of destination". 2025, with a vision to 2030. The goal of the Project is to create a strong change in the awareness and actions of leaders and officials of agencies, organizations, and businesses to promote transformation. Number; universalize digital skills for those participating in the national digital transformation process; improve the quality and effectiveness of training and developing digital transformation human resources in each industry, each field, and each locality. The project also sets out tasks including a group of tasks to raise awareness about digital transformation, a group of tasks to popularize digital transformation skills, group of tasks to develop human resources for digital transformation. Human resource development solutions include a group of solutions on mechanisms and policies; a group of implementation support solutions; group of solutions on financial mechanisms.

Digital transformation affects employment, including the quantity and quality of jobs, thereby affecting the quality of human resources, in the direction of increasing skills and professional qualifications, increasing the workforce with quality, and reducing simple labor. The replacement of labor with machines, robots, and artificial intelligence, leads to a transformation in employment in the direction that jobs can disappear or be partially replaced or create new jobs. Refresh; Work and geographic mobility also increase, one person can do many different jobs in many places, and the gap between rich and poor will increase between those who can adapt and master digital technology. Compared to the rest (Nguyen Manh Quan, 2021) [12].

Requirements for the quality of human resources participating in digital transformation: Under the impact of the 4.0 industrial revolution, the way people live and work has many changes. At work, there is an increase in working online or directly between people, increasing automation in the production cycle, using robots to replace humans, developing artificial intelligence, and increasing labor productivity. Increased due to the use of modern machinery and technology. There are also changes in life by changing shopping and consumption habits, using technology products for shopping, traveling, resting..., life services are increasingly developing. Develop and facilitate smart consumer behavior. To respond to the changes of the 4.0 technology revolution, it is necessary to have a quality workforce with knowledge of new technology that can meet the rapid changes in technology today.

Requirements for the team participating in human resource training: Technology 4.0 indirectly impacts the field of education and the quality of human resources, so it requires a team of teachers with appropriate qualifications. Requirements of the digital age to be able to have enough capacity to train human resources to meet the requirements of digital transformation. Only qualified teachers can access knowledge and thereby be able to equip learners with knowledge. According to (UNESCO), teachers need to have information technology capabilities, including understanding the technology, developing in-depth knowledge, and creating knowledge. In addition, other competencies needed are personal, social, professional, and pedagogical competencies. The supporting skills that lecturers need to pay attention to are innovation, creativity, prediction, experimentation, open thinking, and collaboration in work. Nguyen Anh Thu, and Bui Trang Huong (2021) [18] believe that the teaching staff needs to have teaching capacity; research capacity; technology commercialization capacity; global capacity; future strategic capacity, and capacity to connect and cooperate.

## 3. Research Methods

The article uses the method of document research, analysis - synthesis from the results of the Labor and Employment Survey conducted by Vietnam; Annual statistical yearbook data, legal documents, secondary data on digital transformation, human resource training, general reports on Vietnamese human resources in the digital transformation period of institutions state management agencies,...; From there, evaluate and point out the problems that need to be solved and suggest some proposals to improve the quality of human resources to meet the requirements of digital transformation in Vietnam in the coming time.

## 4. Research results

### 4.1 Current status of human resource quality in Vietnam

In 2021, the labor force aged 15 and over will reach 50.5 million people, down 791.6 thousand people compared to the previous year. The labor force in urban areas is 18.6 million people, accounting for 36.8%; the female labor force reached 23.5 million people, accounting for 46.5% of the country's labor force. The 2021 labor force participation rate is 67.7%, down 1.9 percentage points from the previous year. Trained workers from "Elementary" level or higher in 2021 is 26.1%, an increase of 0.8 percentage points compared to the previous year (General Statistics Office, 2022) [15].

**Table 1:** Percentage of Vietnamese trained labor force at 15 years of age and above by age group and by qualification period 2018-2022

|  | 2018 | 2019 | 2020 | 2021 | Prel.2022 |
|---|---|---|---|---|---|
| **Total** | 22.0 | 22.8 | 24.1 | 26.1 | 26.4 |
| **Vocational training** | 3.6 | 3.7 | 4.7 | 6.8 | 7.1 |
| **Intermediate** | 5.2 | 4.7 | 4.4 | 4.1 | 3.7 |
| **College** | 3.7 | 3.8 | 3.8 | 3.6 | 3.7 |
| **University and over** | 9.5 | 10.6 | 11.1 | 11.7 | 11.9 |

**Source:** General Statistics Office (2022) [15]

Table 1 data shows that the proportion of trained workers in Vietnam increased from 20.4% in 2015 to 26.1% in 2021; The rate of trained workers with degrees and certificates in the first quarter of 2023 is 26.4% (General Statistics Office, 2023) [16]; However, the rate of increase in trained workers in Vietnam is not high, the quality of Vietnam's human resources is still low. This shows that Vietnamese human resources are facing difficulties in meeting the needs of digital transformation.

The labor structure in terms of qualifications is unreasonable, in which workers with college, university, or higher degrees account for a higher proportion than workers with elementary and intermediate levels of education, leading to the phenomenon of Vietnam lacking a large number of professional and technical workers.

Therefore, to be able to achieve digital transformation goals, it is necessary to improve the quality of digital human resources. According to the Global Innovation Index (GII) 2022 report, Vietnam's innovation achievements are very proud, higher than GDP growth and Vietnam has also created many results. Innovation output compared to the level of investment in innovation. Vietnam's GII ranked 48/132 countries (ranked 44 in 2021). This year, there are 36 low-middle-income countries/economies ranked (an increase of 2 countries compared to 2021), Vietnam ranked 2nd, after India (in 2021 Vietnam ranked 1st in 34

countries/economies). In the region, Vietnam continues to rank 4th as of 2021 (after Singapore, Malaysia, and Thailand) (WIPO, 2022) [22].

**Table 2:** Number of employed persons in the economy by occupation period 2018-2022

|  | 2018 | 2019 | 2020 | 2021 | Prel. 2022 |
|---|---|---|---|---|---|
| Total (Thous. persons) | 54,282.5 | 54,659.2 | 53,609.6 | 49,072.0 | 50,604.7 |
| Ratio (%) | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Leaders/managers | 1.14 | 0.95 | 1.03 | 0.98 | 0.94 |
| High-level professionals | 7.02 | 7.83 | 7.99 | 7.33 | 7.19 |
| Mid-level professionals | 3.43 | 3.39 | 3.23 | 3.33 | 3.28 |
| Clerks | 2.00 | 1.96 | 1.90 | 2.30 | 2.43 |
| Personal services, protective workers, and sales worker | 17.70 | 17.43 | 17.98 | 18.95 | 19.26 |
| Skilled agricultural, forestry, and fishery workers | 9.18 | 7.33 | 7.35 | 12.21 | 12.14 |
| Craft and related trade workers | 13.78 | 14.35 | 13.72 | 14.55 | 14.57 |
| Plant and machine operators and assemblers | 10.12 | 12.08 | 13.24 | 14.12 | 14.95 |
| Unskilled occupations | 35.42 | 34.46 | 33.36 | 25.74 | 24.75 |
| Other | 0.20 | 0.21 | 0.20 | 0.50 | 0.49 |

**Source:** General Statistics Office (2022) [15]

According to the General Statistics Office (2022) [15], unskilled workers account for the highest proportion compared to workers in other occupations, however, this proportion also tends to decrease in the period 2018-2022, specifically: 2018, the proportion of simple workers accounts for 35.42% of the total number of workers by occupation, by 2022 it will be 24.75%. The ratio of high-level and middle-level professional and technical workers has not changed significantly. However, the quality of Vietnam's human resources has improved, contributing to improving Vietnam's labor productivity in recent times. Overall, in the period 2011 - 2020, labor productivity increased by an average of 5.07%/year. If compared with other countries in the region, Vietnam's labor productivity is still relatively low, only higher than Cambodia, almost similar to Myanmar and Laos, lower than India, Philippines, Indonesia, China, and Thailand and much lower than Malaysia and Singapore. This poses a challenge for Vietnam in improving the quality of human resources to be able to catch up with other countries in the region.

According to FPT Digital's recent "Digital Human Resources Development Strategy" DxReports, Vietnam has nearly 400,000 information technology engineers and more than 50,000 information technology students graduating each year. However, only about 30% of this information technology workforce meets the actual requirements of the job.

The need for digital transformation of businesses and organizations is increasing, therefore, human resources that meet the requirements of digital transformation in Vietnam are increasingly necessary, not only for workers working in the public sector. Information technology but also workers in other fields.

## 4.2 Current status of establishments participating in human resource training in Vietnam

Vietnam currently has about 240 universities, of which nearly 160 have training in information technology, electronics, and telecommunications. The number of graduates in universities, colleges, and intermediate schools of these majors is more than 65,000 students; Compared to the recruitment needs of units and businesses, there is a huge shortage.

Currently, the whole country has about 1.2 million workers working in the information technology field, reaching an estimated rate of 1.1% of the total number of workers; this figure is relatively low compared to other countries such as India (1.78%), South Korea (2.5%), and the US (4%).

In training institutions, information technology, and digital transformation are gradually deployed to serve teaching and learning, in which lecturers play an important role, directly impacting learners. The teaching staff has had training and fostering programs to improve their qualifications.

**Table 3:** Number of teachers in universities and students in the period 2020-2022

|  | The school year 2020-2021 | | | The school year 2021-2022 | | |
|---|---|---|---|---|---|---|
|  | *Total* | *Public* | *Outside the public* | *Total* | *Public* | *Outside of work create* |
| **Total number of full-time lecturers (person)** | **76576** | **58338** | **18238** | **78190** | **58011** | **20179** |
| Doctor | 23956 | 20090 | 3866 | 25366 | 20753 | 4613 |
| Masters | 46062 | 34038 | 12024 | 46942 | 33681 | 13261 |
| University | 5890 | 3774 | 2116 | 5514 | 3434 | 2080 |
| Other qualifications | 668 | 436 | 232 | 368 | 143 | 225 |
| **Structure of full-time lecturers (%)** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| Doctor | 31.28 | 34.44 | 21.20 | 32.44 | 35.77 | 22.86 |
| Masters | 60.15 | 58.35 | 65.93 | 60.04 | 58.06 | 65.72 |
| University | 7.69 | 6.47 | 11.60 | 7.05 | 5.92 | 10.31 |
| Other qualifications | 0.87 | 0.75 | 1.27 | 0.47 | 0.25 | 1.12 |
| **Student size (people)** | **1905956** | **1540599** | **365357** | **2145426** | **1728856** | **416570** |
| **Student/faculty ratio (%)** | **24.89** | **26.41** | **20.03** | **27.44** | **29.80** | **20.64** |

**Source:** Ministry of Education and Training, 2023

After 14 years of implementing "University and College Network Planning for the period 2006 - 2020", the university teaching staff has changed clearly in both quality and quantity. According to statistics, in 2019 Vietnam had 73,312 lecturers, working at 237 universities, academies, 37 scientific research institutes, 33 pedagogical colleges, and 2 pedagogical intermediate schools. Of these, nearly 21,000 lecturers have doctoral degrees (more than 28%), and more than 44,700 lecturers have master's degrees (60.9%). This number has more than doubled compared to 2005 (12% of lecturers have doctoral degrees and 32% of lecturers have master's degrees). In the 2021-2022 school year, Vietnam has 78,190 lecturers, of which the proportion of lecturers with doctoral degrees is 32.44%, this rate is increasing every year, reflecting the quality of the teaching staff with the increase. Universities have focused on improving the quality of lecturers and standardizing the qualifications of lecturers according to the provisions of the Law on Education and the Law on Higher Education. Many schools have proposed policies to compete and attract good lecturers with high academic qualifications, degrees, and scientific research ability to become full-time lecturers of the school.

Vietnam's student/faculty ratio in 2021-2020 is 27.44, this number is much higher than other countries in the region; According to UIS data, in 2015, the student/faculty ratio of Indonesia was 22, Malaysia 16, and South Korea 14; The number of lecturers is currently lacking and cannot meet training needs (Hoang Thi Thu Ha, 2021) [9].

## 5. Recommendations

Human resources are the most important resource in the process of implementing digital transformation. To have capable human resources participate in the digital transformation process and meet the set goals, within the research framework, the author proposes several proposed solutions as follows:

+ On the part of the Government

To have a workforce that meets the requirements of digital transformation, the training program is fundamental, training human resources to ensure the set goals. The Ministry of Education and Training regularly presides and coordinates with the Ministry of Labor, War Invalids, and Social Affairs, ministries, and branches to develop training programs and human resources according to the requirements of the labor market.

Direct educational institutions to develop plans and organize training for digital transformation teachers, update and supplement training content on digital transformation and digital technology in existing training majors of the school. Training facilities.

Develop and promulgate a set of indicators and criteria for evaluating the digital transformation of training institutions to have a basis for determining the level of digital transformation in training institutions.

+ For businesses

Enterprises are units that directly employ workers, the quality of labor will directly affect the results of production and business activities of the enterprise. Reality shows that businesses applying digital transformation will have a higher success rate, achieve set goals, reduce management costs, and increase labor productivity. Therefore, to be able to successfully transform digitally, businesses need to prepare well resources such as facilities, technology, and especially human resources of the unit. Enterprises need to be proactive in training and improving technical expertise for workers through the following measures:

Building a learning culture at businesses to enhance employees' ability to self-study and access new knowledge and technology. Enterprises that build a good learning culture will have a positive effect in changing the learning behavior of employees, they will truly proactively explore and learn to improve themselves and raise their

qualifications.

Have a training plan for the enterprise's employees, so that they are equipped with the necessary knowledge to complete their current jobs as well as take on new tasks in the future.

Building a corporate library is where employees have the opportunity to access new knowledge. Set aside a certain number of hours for workers to come to the library.

Strengthen ideological education for workers, so that workers have a working mindset and are ready to adapt to change.

+ For workers

In traditional working models, there is little change, workers perform work based on determined databases, however, in the digital transformation period, technology, work processes, and interactions between colleagues are also constantly changing, so workers working in the 4.0 revolution need to be ready for changes in work, have thinking, and have knowledge related to work. New technology and application to work. According to Decision No. 176 dated February 5, 2021, of the Prime Minister promulgating the Labor Market Development Support Program to 2030, the target rate of trained workers with degrees and certificates will be 30%. by 2025 and reach 35-40% by 2030; Labor index with specialized knowledge in the global innovation index (GII) in the top 60 countries in 2025 and top 55 countries in 2030; the proportion of workers with information technology skills will reach 90% by 2030; increase the number of workers with skills appropriate to labor market needs. Looking at that goal, we can also see that the Government is very determined to build a creative and knowledgeable workforce in the digital transformation period. Therefore, the workforce needs to improve their capacity, self-study to improve their qualifications, and participate in training and refresher courses to be able to meet current and future job requirements.

+ For educational establishments

Proactively review training programs, develop advanced training programs, and associate training content with digital transformation; Strengthen building relationships with businesses to link teaching content with practice at businesses, helping workers be proactive when participating in the labor market.

Enhance the digitalization of facilities, libraries, classrooms, and management processes for staff, lecturers, students, teaching, and professional activities of the school. Not just modernizing and digitizing facilities.

Universities need to develop their human resources to meet the requirements of Industry 4.0. Developing the capacity of teachers to meet the requirements of the 4.0 industrial revolution. First of all, teaching staff must be aware of the important position of the 4.0 revolution, from a good awareness of new problems leading to a change in thinking and action. Regarding professional capacity, teachers need to constantly improve their professional knowledge; Build and develop advanced teaching programs, update new technological knowledge; Use active teaching methods, apply modern means and equipment well in teaching, transform teaching methods, manage classes, interact with learners through digital space, exploit information technology. Information to organize teaching. Lecturers also need to have scientific research ability, and logical reasoning ability, and form research groups to promote scientific research and keep up with world research trends.

Promote the transfer and application of scientific research into practice, and cooperate well with businesses to increase the application of scientific research products.

## 6. Conclude

Digital transformation changes the management process, production and business organization, and the process of performing organizational tasks. To ensure the achievement of the Government's socio-economic and human resources goals during the digital transformation period, it is necessary to build a workforce that can meet the tasks of digital transformation... The article analyzed the requirements and goals for the quality of human resources in Vietnam during the digital transformation period, assessed the current state of human resource quality, and proposed some solutions from the Government and businesses, workers, and training facilities to improve the quality of human resources to meet digital transformation requirements.

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