

Employees of Industry Enterprises in the Fourth Industrial Revolution: Evidence in Thai Nguyen Province, Vietnam

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ABSTRACT

The Industrial Revolution 4.0 brings many benefits such as increasing labor productivity, thereby increasing the average compensation per month of employees by applying modern technologies to the production process, but also poses many challenges such as job loss and other social problems. The study examines the current status of employees' quantity and employees' quality. The research has used descriptive statistics utilizing numerical and graphical methods with the comparative method to show the situation in Thai Nguyen's Industry enterprises, in Vietnam. The results find that the number of employees has increased, and employee quality is improved, but employees in Thai Nguyen's Industry enterprises still lack many skills to meet the requirements of the change in the Industry 4.0.

Keywords: Employees, Industry enterprises, The Fourth Industrial revolution, average compensation, productivity.

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I. INTRODUCTION

The Fourth Industrial revolution has a strong impact on all aspects of life, economy, society, production, business activities, organizations, individuals, security... For the economy, it is changes in growth, employment, and work. For enterprises, production and business activities are consumer expectations, product information data, innovation cooperation and new operating models, new services, and business models. The Industrial revolution 4.0 is considered as the highlight of the digital era and it has a strong impact on industries and occupations in the economy of each country, including Vietnam - a country with a large supply labors.

Thai Nguyen province is one of the political, economic and educational centers of the Northern midlands and mountain areas in Vietnam. In recent years, many Industrial enterprises (including Mining and quarrying enterprise; Manufacturing enterprise; Electricity, gas, steam and air conditioning supply enterprise; and *Water* supply, sewerage, waste management and remediation activities enterprise) have established and attracted employees from other provinces to work. The Industrial Revolution 4.0 has been affecting the quality of human resources, the necessary labor skills in the new technology era in addition to the hard requirements of technical skills (medium and high levels) including knowledge and skills and specialized skills belonging to technical expertise in order to perform specific jobs, it is necessary to have soft or core

working skills such as: Creative thinking ability and initiative in work, skills in using computer, internet, foreign language ability, teamwork skills, safety skills and labor discipline compliance, problem solving skills, time management skills, concentration skills. According to Thai Nguyen statistics office (2021), the percentage of trained employees in Industry enterprises was 24.7% in the year 2018, this rate increased to 28.2% in 2020. Although the labor force is quite abundant, the quality of supply is still low and improving, but this process is quite slow.

Many previous studies have empirically investigated the employees in much kind of enterprises, organizations in countries in many contexts such as Edwards and Cable (2009), James (2000), Linjuan (2011), Melvyn et al (2019). In the Industry 4.0, employees in Industry enterprises have played an important role, so many current studies have empirically investigated necessary skills development for employees in enterprises, organizations, and countries in the world, such as Gerlind et al (2017), Kergroach (2017), Paul (2016), Rocha (2018). According to Kergroach (2017), the research presented an overall picture of the latest technological trends altogether referred to as the Industry 4.0, their impact on the changing structure of the labor market, the demand for prospective skills, as well as emerging policy challenges.

Today manufacturing industry is based on multiple suppliers located in different countries and continents,

intensively using automation, data exchange and advanced manufacturing technologies embedded in the digital era, and a number of national and international initiatives are devoted to support this effort. New opportunities to advance manufacturing of high value products are based on innovating the measuring technologies and procedures for Geometrical Quality Control, in particular addressing the training needs since having well trained professionals is an important key of success for manufacturing companies in several sectors, Rocha (2018).

The present analysis provides practically useful implications. Based on the previous studies, it can be seen that even though employees quality in organization has been widely known and applied. However, to the best knowledge of the researcher, there is not much study to neither clarify the situation employees of Thai Nguyen's Industry enterprises in the Fourth Industrial Revolution. So, the main of this paper is centered on the quantity and quality of employees of Industry enterprises, as well as their average income and the productivity in the Industry 4.0.

II. METHODOLOGY

The secondary information is collected from the statistical office of Thai Nguyen province.

The descriptive statistics utilize numerical and graphical methods to illustrate the number of enterprises, the number of employees and their average compensation per month, as well as their productivity in Industry enterprise, to summarize the information it reveals and to present that information in a meaningful way.

The comparative method is used to analyze results, compare, and compare the level of achievement in terms of quantity and quality of employees in the period from 2013 to 2020.

III. RESULTS AND DISCUSSION

A. The Employees Quantity of Industry Enterprises in Thai Nguyen Province, Viet Nam

Thai Nguyen with favorable conditions in terms of geographical location, traffic, socio-economic development, ... along with the trend of developing the digital economy and integration of the whole country, Thai Nguyen Provincial People's Committee approved Decision No. 1550/QD-UBND dated June 13, 2017 approving the Project on improving the investment environment and international integration in the 2016-2020 period, creating favorable conditions for the province's enterprises development, including Industrial enterprises.

Fig. 1 has shown that the number of Industrial enterprises increased rapidly in the period of 2013 - 2020, especially the number of manufacturing enterprises. In 2013, the number of

manufacturing enterprises were 3275 enterprises; in the year 2018 the number of these enterprises increased by about 2.2 times, reaching 807 enterprises. Meanwhile, the number of the electricity, gas, steam, and air conditioning supply sector decreased from 35 enterprises in 2013 to 28 enterprises in 2018.

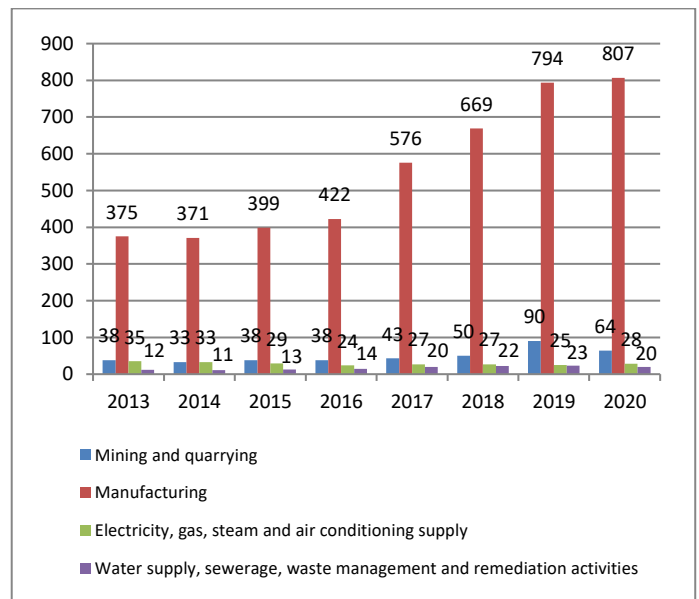


Fig. 1. Number of Industry enterprise in Thai Nguyen province, Viet Nam (Unit: enterprise).

Along with the increase of industrial enterprises, employees working in the province also have many job opportunities during the study period. According to [9], in recent years, the number of employees working in 2018 was 162,068 people, but due to the severe impact of the Covid-19 epidemic, the number of employees in these enterprises decreased to 156,776 people. Some areas of lockdown have had to close some non-essential business and production activities, affecting the jobs of millions of workers.

The Covid-19 pandemic also contributes to changing working habits, promoting the application of information technology of employees to adapt to unpredictable developments of the pandemic; employees have changed from not applying information technology (IT) to applying IT in their work in the Fourth Industrial Revolution.

Table I has shown that enterprises operating in industries such as Mining and quarrying, heavy-duty processing and manufacturing (processing wood and wood products; manufacturing mineral, metal, and non-metallic products; manufacture of electronic products,...); Electricity, gas, steam and air conditioning supply... having a hard working environment, working outdoors, with dangerous and harsh conditions... so the number of male employees is more suitable than female employees, and always higher than that of female.

TABLE I: EMPLOYEES QUANTITY IN INDUSTRY ENTERPRISES IN THAI NGUYEN PROVINCE, VIETNAM

Industry enterprises	2018		2019		2020	
	Male (person)	Female (person)	Male (person)	Female (person)	Male (person)	Female (person)
Mining and quarrying	2207	714	2455	759	1883	664
Manufacturing	48850	106563	50321	106004	49525	101397
Electricity, gas, steam, and air conditioning supply	1340	560	1307	537	1336	506
Water supply, sewerage, waste management and remediation activities	891	943	795	888	718	747
Total	53288	108780	54878	108188	53462	103314

Besides Manufacturing enterprises and Water supply, sewerage, waste management and remediation activities enterprises with modern machinery and technology to reduce human physical labor. In addition, businesses operating in the industry need ingenuity, meticulousness, working conditions are not too hard... such as production of costumes, etc. are increasingly developed, suitable for women. Therefore, in this period, the number and proportion of female employees always accounts for a higher proportion than male employees.

B. The Employees Quality of Industry Enterprises in Thai Nguyen Province, Viet Nam

In Industry 4.0, besides professional qualifications, employees need to have a lot of necessary skills to meet the requirements of the labor market. The combination of professional qualifications and skills (thinking ability, creativity, teamwork, ability to analyze work priorities ...) is extremely necessary to equip human resources, best practices and promote self-recovery in the ever-changing labor market of the digital revolution.

TABLE II: PERCENTAGE OF TRAINED LABOUR FORCE IN ENTERPRISES BY REGION IN VIETNAM

	UNIT: %		
	2018	2019	2020
Thai Nguyen	24.7	27.2	28.2
Northern midlands and mountain areas	18.4	18.2	20.5
Ha Noi capital	42.0	48.1	48.5
Red River Delta	29.6	32.4	32.6
North Central and Central coastal areas	21.3	21.5	22.7
Central Highlands	14.2	14.3	16.9
Ho Chi Minh city	36.8	37.1	38.7
South East	28.0	28.1	29.5
Mekong River Delta	13.4	13.3	14.9
Whole country	22.0	22.8	24.1

The percentage of trained workers in Thai Nguyen increases every year, contributing to improving the quality of labor in enterprises. Table II has illustrated that the rate of trained workers was 24.7% in the year 2018. This rate increased to 28.2% in 2020. Compared with the average level of the Northern midlands and mountain areas, Thai Nguyen's trained labors are always at the highest, because Thai Nguyen is one of the education and training centers with the number of universities only after Hanoi Capital and Ho Chi Minh City.

Table III shows that the average income of employees working in industrial enterprises tends to increase, in which workers in manufacturing enterprises have the highest income compared to other areas. In 2017, the average

monthly income of laborers working in manufacturing enterprises was 9,591 million dong; by 2019 to increase to 10,065 million dong. The increase in average income of working employees helps employees improve their lives, create a favorable basis for employees to work, and improve work efficiency.

Despite having the highest average income compared to other enterprises in the industry, the labor productivity of manufacturing enterprises is ranked after the labor productivity of electricity, gas, steam and air conditioning supply enterprises. In the period from 2017 to 2019, the labor productivity in electricity, gas, steam and air conditioning supply enterprises increased from 4970083 million dong/month to 6420.228 million dong/month. Although the labor productivity of Industrial enterprises tends to increase, it is still low and not commensurate with the development potential of Thai Nguyen province in the Fourth Industrial revolution.

Covid-19 is a "shock" to the global labor market as well as Thai Nguyen province, Vietnam, causing disruptions to the labor market, increasing unemployment and social inequality, especially for the young workforce. In the Industrial Revolution 4.0 and the Covid-19 pandemic, the transition of jobs and skills has been accelerated to adapt to the structural adjustments of the global economy. Jobs lost in old, outdated industries are expected to be replaced by new jobs in growing green and creative industries. To meet the requirements of the new world of work, an estimated 50% of workers need retraining and advanced training in skills (reskilling and upskilling).

IV. CONCLUSION AND RECOMMENDATION

The results of the research investigated that in Industry 4.0, the number of employees has increased and employee' quality is improved to meet the requirements of working at Industry enterprises in Thai Nguyen province, Vietnam. Labor productivity and average compensation in Industry enterprises tends to be improved due to steps in reducing manual labor and replacing with machinery and technology.

However, employees in Thai Nguyen's Industry enterprises still lack many skills. Most of the employees are untrained or unskilled who have not yet met the needs of enterprises development. Therefore, the Covid-19 epidemic and the Fourth Industrial revolution have created many challenges but also bring many opportunities to improve vocational skills for employees.

TABLE III: AVERAGE COMPENSATION PER MONTH AND PRODUCTIVITY OF EMPLOYEES IN INDUSTRY ENTERPRISE IN THAI NGUYEN PROVINCE, VIET NAM

Industry enterprises	2017		2018		2019	
	Average compensation (million dong/month)	Productivity (million dong/year)	Average compensation (million dong/month)	Productivity (million dong/year)	Average compensation (million dong/month)	Productivity (million dong/year)
Mining and quarrying	7.585	962.2876	10.364	1316.467	9.240	1040.23
Manufacturing	9.591	4804.036	9.843	4622.546	10.065	5073.018
Electricity, gas, steam, and air conditioning supply	7.017	4970.083	8.523	5641.474	9.369	6420.228
Water supply, sewerage, waste management and remediation activities	7.028	595.5331	7.843	640.7306	8.954	530.8378

Thai Nguyen provincial authorities need to coordinate and implement policies and digitization projects to support labor development for Industrial enterprises...creating favorable conditions for workers to have the opportunity to be trained and retraining in the Industry 4.0. In addition, businesses need to develop specific standards for employees to train in accordance with each type of business in the new context. Enterprises are forced to restructure production, which makes them unable to use more labors, instead of using quality labors. This is a condition to promote enterprises to improve the qualifications and skills of their employees. Besides, labors can self-study at school, study at work, or apply all methods to improve skills.

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