



# **HUMAN RESOURCES' QUALITY IN SMALL MEDIUM-SIZED ENTERPRISES IN INDUSTRY 4.0: RESEARCH IN THAI NGUYEN PROVINCE, VIETNAM**

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## **Abstract**

*This study was conducted to analyze the quality of human resources in Thai Nguyen SMEs enterprises in Vietnam in Industry 4.0. Secondary data in the period between 2013 and 2018 was collected and analyzed with descriptive and inferential statistics. The results of the article have shown that the wave of artificial intelligence can lead to mass unemployment in Thai Nguyen province, as a large number of Vietnamese laborers will not be able to adapt to new technologies. In the Industry 4.0, labourer's non-state enterprise has many opportunities to approach and participate in the new technology as it has a youthful labours market with "golden population struture". Research finding are used a basis for r proposing recommendations to improve the quality of human resources in SMEs in the fourth Industrial revolution with geographical indications in Thai Nguyen province, Vietnam.*

*Keywords: Human resources' quality, small and medium-sized enterprise, the fourth Industrial revolution, golden population structure*



## INTRODUCTION

The Industrial Revolution 4.0 is becoming one of the top concerns of countries around the world and Vietnam is not out of the general trend. With the breakthrough of scientific and technological achievements, the revolution will have a powerful impact especially on underdeveloped and developing countries, including Vietnam, which has been revolutionizing ever since.

In the process of existence and development of enterprises; human resources, especially high quality human resources are the resources that influence the development of enterprises, especially in Industrial revolution 4.0 will create major changes in labours supply and demand. Thai Nguyen province is in a period of "*population surplus*" or "*golden population structure*" with more than 50% of the population in working age. Population benefits provide a great opportunity for Thai Nguyen province as well as Vietnam to make the most of this abundant human resource and create strong pressure to secure jobs, meet the needs of education and training, improve the quality of human resources. In terms of quantity, Vietnam seems to have an advantage in terms of labors. However, the quality of workforce through trained technical expertise shows that this is a worry issue. Some labors market reports assessing the industrial revolution 4.0 not only threatens the employment of low-level laborers, even middle-skilled workers, will suffer if they do not acquire new knowledge, mainly creative skills.

The respective impact of human resources and employees who worked in typical enterprises has received much attention in various researches. These studies showed that human resources in the enterprises has become one of the most important research issues, especially in the context of globalization, internationalization and more specifically, in the context of the explosion of science and technology in the fourth industrial revolution.

The research was conducted to analyze human resources' quality in Small and medium-sized enterprises in Industry 4.0 through secondary data from Thai Nguyen statistic.

## RESEARCH METHODOLOGY

### Research site

Thai Nguyen province is one of the political, economic and educational centre of the northern mountainous midland in Vietnam. Along with trending of economic development and the Industrial revolution 4.0 in Vietnam as well as the northern mountainous midland, Thai Nguyen province; with favorable conditions on geographic location, socio-economic characteristics; has created favorable conditions for the enterprise's development. In addition, with the policies about investment and enterprise development of Thai Nguyen's provincial leaders, many

enterprises have established and attracted thousands labours from others provinces to work; but the amount of agricultural enterprises increased slowly. Specially, Thai Nguyen's employees in agricultural enterprises have lacking in various skills in order to adapt the changing of the Industry 4.0. So that, the author selects Thai Nguyen province for the research site (Thai Nguyen statistics office, 2019).

### **Data collection**

The data used in this study are quantitative and qualitative data. Quantitative data obtained such as the number of acting SMEs enterprises, the amount of human resources and the human resources structure in SMEs enterprises in the background of the fourth Industrial revolution, from 2013 to 2018 in Thai Nguyen province, Vietnam.

Secondary data of the Thai Nguyen statistics office and General Statistics Office of Vietnam were used. These data is retrieved and collected in connection with research in order to analyze for this research.

### **Descriptive and Inferential Statistics**

Descriptive analysis and inferential statistical analysis were used in this article. Descriptive statistics utilize numerical, tables and graphical methods describes the quality of SMEs human resources in the Industrial revolution 4.0 for each indicator and the average score obtained to summarize the information it reveals and to present that information in a meaningful way.

Inferential statistics uses the data to make estimates, decisions, predictions, or other generalizations about SMEs human resources in Thai Nguyen in the fourth Industrial revolution from which the data was obtained.

## **ANALYSIS, FINDINGS AND DISCUSSION**

Along with the general development trend of whole country, Thai Nguyen has favorable conditions on geographical position, socio-economic characteristics. Thai Nguyen Provincial People's Committee approves in Decision No. 1550 / QD-UBND on June 13th, 2017 about the Project of improving investment environment and international integration in the period from 2016 to 2020, creating favorable conditions for the development of enterprises in the area, especially SMEs. As of January 1st, 2018, Thai Nguyen province had 3,448 enterprises. Out of 3,448 enterprises in the province, the number of SMEs was 3,347 enterprises (accounting for 97.07%).

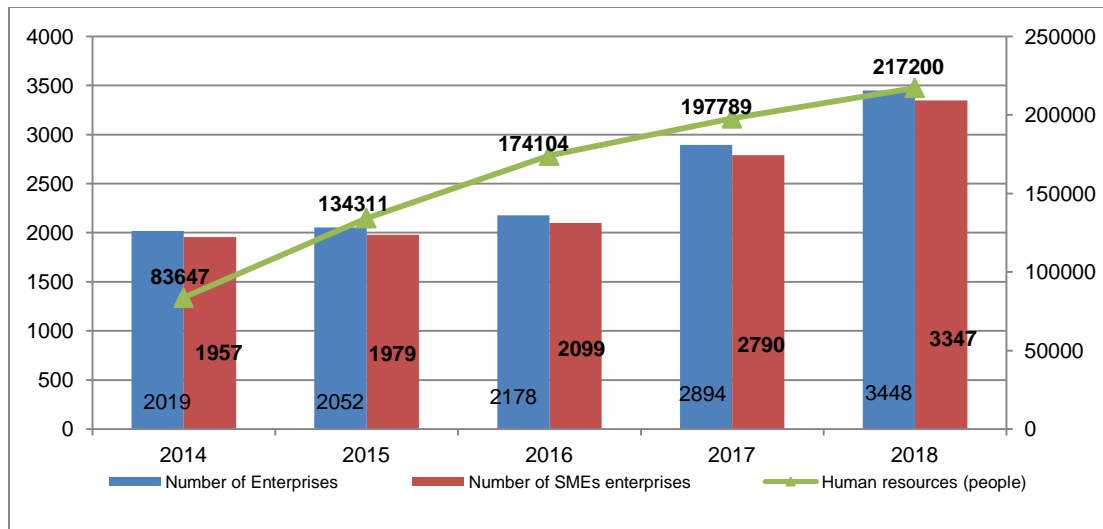


Figure 1. The number of SMEs and SMEs' human resources in Thai Nguyen province

Source: Thai Nguyen statistics office (2017- 2019)

The number of employees working in enterprises, especially in SMEs from 2013 to 2018, has increased significantly. In 2013, the number of employees working in the enterprise was 86,276 people, while the amount of employees decreased to 83,647 people in 2014 (down 2629 people compared to 2013, equivalent to 3.05% reduction); with the rate of economic activity among people also decreased to 7.13% (out of 100 people, only 7.13 people work in enterprises).

In 2015, the number of employees working in enterprises increased very high, with the highest growth rate during the period of 2013 - 2018, reaching 60.57%; with the number of employees working in the enterprise reached 134,311 people. In 2016 and 2017, the number of employees working in enterprises tended to increase with the number of employees working in enterprises, 174,104 and 197,789 respectively. However, the labor growth rate tended to decrease to 29.63% in 2016 and 13.6% in 2017. The rate of economic activity of the population in 2017 and 2018 increased significantly to 15.76% and 17.13%.

In the period of 2013 - 2018, the Government has built and completed supporting policies for SMEs development in general and human resource development for SMEs in particular. The SMEs human resource training and development plan is integrated into the five-year, five-year socio-economic development plans of the ministries, branches and localities. Resolution No. 35 / NQ-CP of May 16th, 2016 on supporting business development up to 2020, affirming that enterprises are served as subjects, creating favorable conditions for people and businesses to start businesses, freedom to do business in industries that are not prohibited by law. Strong support and flexible mechanism in building an open, transparent, attractive and favorable investment environment for investment attraction and business development,

improvement of administrative procedures and construction infrastructure,... People's Committee of Thai Nguyen province approved in Decision No. 1550/QD-UBND dated June 13th, 2017 approving the Project on improving the investment environment and international integration in the 2016-2020 period. In addition, People's Council of Thai Nguyen Province issued Resolution 04/2012/NQ - HDND on the Master Plan for Human Resources Development of Thai Nguyen Province, the period of 2012-2020 but mainly developed the overall human resources of the province and there is no specific policy on human resource development for SMEs in Industry 4.0. The strong support and flexible mechanism in creating investment environment, improving administrative procedures, building infrastructure, etc. of Thai Nguyen province have created conditions for many businesses, including a large number of domestic and foreign SMEs have been established, thereby contributing to creating jobs for many human resources of Thai Nguyen province as well as other provinces in the region. The number of human resources working in enterprises in 2014 decreased significantly with the growth rate of labor of negative value, due to the impact of the difficult situation of the economy in 2013 globally and in Vietnam has led to bankruptcy of the number of businesses, especially SMEs. In 2014, thanks to the investment encouragement of the province and the highway 3 was invested to upgrade and facilitate the circulation; so the number of newly established businesses increased very high, especially the number of enterprises in general and SMEs in particular in industrial zones in Song Cong city, Pho Yen town and Phu Binh district. By 2015, when new enterprises came into operation, it created conditions for human resources of Thai Nguyen province and neighboring provinces to work, so the number of human resources working in enterprises increased sharply with the growth rate. employees working in enterprises achieved the highest value in the period of 2013-2018; 10 times higher than the population growth rate of the whole province.

In addition, the rate of economic activity in the population is increasing, the highest in 2018 reached 17.13%, showing the increasing rate of human resources working in enterprises compared to the total population of the province, with a young age and a "population surplus" capable of meeting the labor needs of SMEs in Thai Nguyen province. In addition, the high number of human resources and the proportion of human resources working in enterprises is also due to the migration from neighboring provinces such as Bac Giang, Bac Ninh, Tuyen Quang, Bac Kan ... to work in SMEs and industrial zones of Thai Nguyen province.

Thai Nguyen province is in the "golden population structure", so human resources working in SMEs enterprises are very young age. From 2012, the employees from 16-55 years old accounted for 94.1% of the total number of employees in the enterprise (in which, employees aged 16-34 years old accounted for 60.5%; workers from 35-55 age accounted for

33.6%); laborers from 56-60 years old and over 60 years old only accounted for 4.8% and 1.1%, respectively. By 2017, the labor force from 16 to 55 years old increased to 98.4% of the total number of employees in the enterprise (of which, employees aged 16-30 years accounted for 59.9%; employees from 31-45 years old accounting for 31.6%, laborers from 46-55 years old accounted for 6.9% only); while workers from 56-60 years old and over 60 years old reduced to 1.3% and 0.3% respectively. The information about the proportion of Human resource structure in Thai Nguyen's SMEs by age group has illustrated as figure 2:

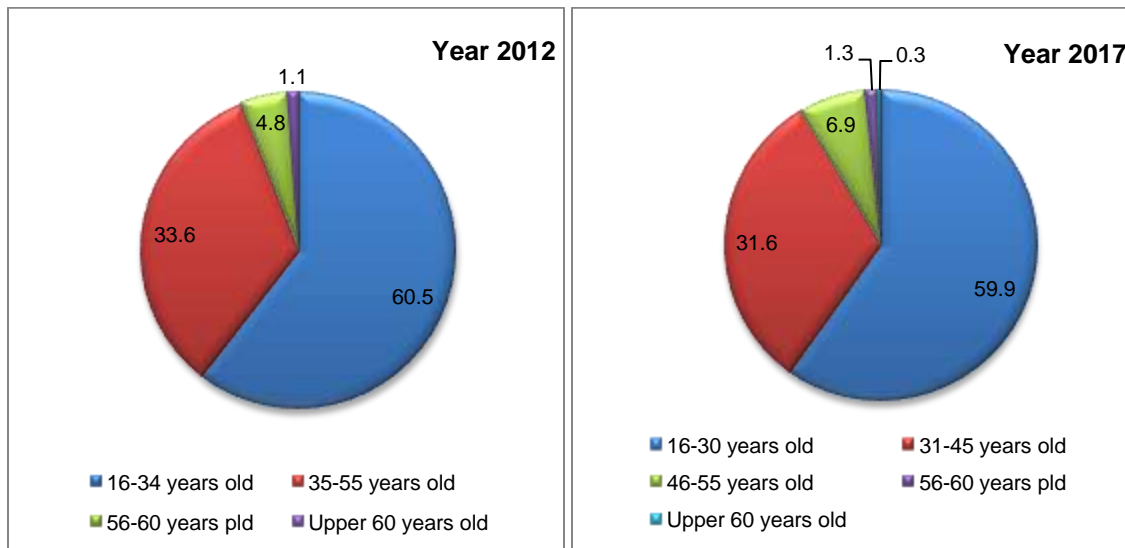


Figure 2. The proportion of Human resource structure in Thai Nguyen's SMEs by age group (Unit: %)

Source: General Statistics Office of Vietnam (2013, 2018)

Young human resource is the advantage for business development, with the acquisition of professional knowledge, new science and technology in the fields of production and business. In addition, young workers have good physical strength, agility and flexibility to adapt to changes in work, especially in Industry 4.0. Machines and robots are gradually replaced simple and repetitive tasks, whereas the unemployment of young labor force is increasing as the competitiveness in labor market. In addition, although it is in the period of "golden population structure", the population aging rate in Vietnam in general and Thai Nguyen province in particular is taking place very fast; while the training and development of human resources are big challenges for labor market in Industry 4.0. The proportion of Human resource structure in Thai Nguyen's SMEs by professional qualifications is shown as follow:

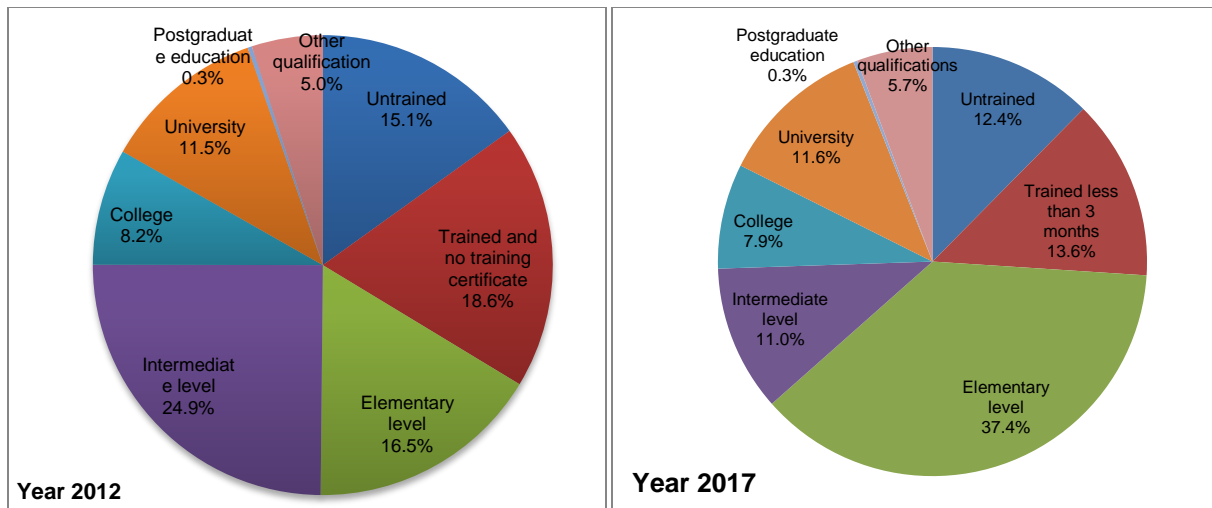


Figure 3. The proportion of Human resource structure in Thai Nguyen's SMEs by professional qualifications (Unit: %)

Source: General Statistics Office of Vietnam (2013, 2018)

Professional qualifications of human resources working in SMEs have changed in a positive direction in Industry 4.0. In 2012, the percentage of unskilled labor decreased from 15.1% to 12.4% in the period from 2012 to 2017. The percentage of short training's human resources reduced by 5%, from 18.6% to 13.6%. Meanwhile, the proportion of workers through Elementary vocational training courses tended to increase rapidly from 16.5% to 37.4%. From 2012 to 2017, the percentage of employees through Intermediate vocational training dropped sharply from 24.9% to 11%. The number of labor with college degrees in 2012 was 8.2%, in 2017 slightly decreased to 7.9%. The proportion of employees graduating university and postgraduate degrees have not changed much since 2012. In 2017, the proportion of university-educated workers increased by only 0.1% compared to 2012 with the rate of 11.6%, whereas workers with postgraduate qualification remained at 0.3%.

According to Thai Nguyen Statistic office (2018), Thai Nguyen province is one of the political, economic and educational centre of the northern mountainous midland in Vietnam is experiencing a period known as the "Golden Population Structure" with 61.26% of the working-age population, a period that occurs only once in the demographic history of each nation. In total enterprises in the province, the number of SMEs accounted for 97.07%. The economy is mainly dependent on the use of cheap labor in many occupations such as apparel, footwear, mining natural resources,... with the level of workers is not high, labor income compared with many countries in Southeast Asia, has a long gap. Following the estimating by the International Labour Organization (Aradhana, 2016), the automation in the Industry 4.0 can be replaced 64%

of Indonesian textile, clothing and footwear, 86% in Vietnam, 88% of Cambodia in the next decade. Industrial revolution 4.0 also poses many challenges, especially that will dramatically change the structure of labors and the labors market. Automation systems will gradually replace manual labors in the economy as a whole. This will affect the income of simple workers and increase unemployment. The tendency of Average employee's income per month in Vietnam and some Asia Pacific countries is shown as figure 4:

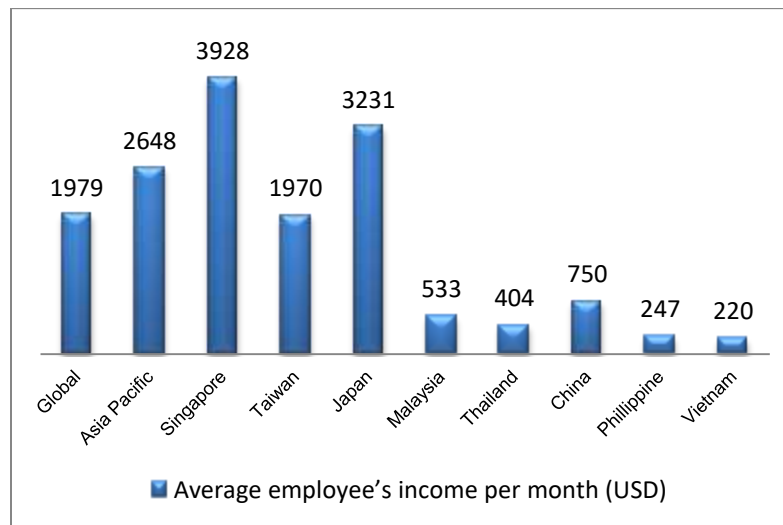


Figure 4. Average employee's income per month in Vietnam and some Asia Pacific countries  
Source: Manpower Group Solutions (2018)

## CONCLUSION AND RECOMMENDATIONS

This paper investigates human resources' quality in Thai Nguyen's SMEs enterprises in Industry 4.0. The study results show that in the period of 2013-2018, Thai Nguyen's human resources in the period of "population surplus" with 59.9% of workers aged 16-35. With professional qualifications, up to 12.4% of workers had not been trained; 11.6% of workers have university degrees; 0.3% postgraduate degree.

Provincial leaders and organizations should have ways of forecasting the labor market needs in "The Wave of Technology". There should be policies to help human resources in SMEs be consulted, be fully informed about labor market needs, avoid unemployment after training. In addition, the training of human resources in SMEs should be integrated with other national target programs, particularly in connection with the new development program of the national target.

When migrating to Industry 4.0, the labor market will have surplus labor, especially low-skilled workers. From there, it is necessary to have a mechanism to improve the quality of



human resources in the fourth Industrial revolution. In addition, SMEs need to combine with training institutions to develop specific training programs in order to integrate training with production. Human resources need to improve actively their skills, self-consciousness, practice the industrial style actively adapt to the requirements of agriculture 4.0.

With this study, the result can support for human resource for economic sector, economic component and each SMEs have different characteristics of environment, policies, managers, etc., the result and recommendations are only quality representative for all SMEs in Thai Nguyen province, with the proposed are the basis for the province's SMEs to apply according to the practical conditions of each business. The future research, the authors are going to focus on which elements affect human resource in SMEs, with case study of human resource in Vietnam.

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