

The Relationship Between Industrialization, Modernization and Knowledge Economic Development in Vietnam

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Abstract

The problem of knowledge economy has only appeared in recent decades, but it is a topic of increasing interest to many scientists in the world as well as in the country. Although from different perspectives, researchers all affirm that knowledge is an economic force that creates growth and change. In the course of the research, the author also found that the world economies have switched from using muscle labor to using brains. This shift has made the economies the fastest growing. Today, with the strong development of the fourth industrial revolution, the world's economies are closer together.

Vietnam is a developing country and always focuses on the relationship between industrialization and modernization and knowledge economic development. That focus has initially yielded encouraging results. In this article, the author will highlight the role and the importance of the knowledge economy in Vietnam in relation to the process of industrialization and modernization.

Keywords: relationship; industrial; modernization; economy; knowledge.

Introduction

In each stage of development, people have their own ways to produce products to serve their needs. The factor that plays a decisive role in making the way of production change and human development is the productive force. Karl Marx once said that social relations are closely associated with the productive forces. By acquiring new productive forces humans have changed his mode of production, and thus his mode of production, his way of earning a living, he has changed all his social relations. The productive forces are the result of practical human capacities achieved in each historical period. Thus, it can also be said that the development process of human society is associated with practical activities and cognitive activities of people. In the process of improving nature - society, knowledge is produced, developed, disseminated and applied more and more widely, scientific knowledge becomes an important driving force for social development. The leaping development of science and technology has given a rise to many industries and fields of labor mainly based on knowledge. Knowledge plays a great role in increasing labor productivity and improving product quality. Knowledge-based economic development will save natural resources, reduce environmental pollution, and reduce labor burden. The content of

knowledge in the entire production process as well as crystallization in the product is increasing, knowledge becomes more and more a driving force for socio-economic development, etc. From here, the knowledge economy emerges. It is an economy based more on scientific knowledge than on natural resources and muscular labor.

Research Methods

The article is researched and presented by the author on the basis of historical methods, methods of dialectical materialism and historical materialism. In addition, the author uses specialized research methods combined with interdisciplinary research methods, and also uses methods such as: analysis and synthesis; logical and historical methods, statistical methods, deductive and inductive methods, and generalization methods.

From the reality of economic development of the country, the Communist Party of Vietnam proposed a strategy to develop the knowledge economy in association with the process of industrialization and modernization of the country. The Communist Party of Vietnam emphasizes: *“Our country's path of industrialization and modernization needs and can be shortened compared to previous countries, with both sequential steps and leaps. Taking into account the country's advantages, taking advantage of all possibilities to achieve advanced technology, especially information technology and biotechnology. Taking advantage of the application of a higher level and popularizing new achievements in science and technology, gradually developing the knowledge economy*(Communist Party of Vietnam, 2008, p. 546).

After nearly 35 years of implementing the Party's Doi Moi policy, Vietnam's economy has achieved important success. From a backward agricultural economy with 90% of the population working in agriculture, material and technical foundations and socio-economic infrastructure have gradually been built to meet the need of industrialization and modernization. The scale of the economy increased rapidly; per capita income has surpassed the low-income threshold, bringing Vietnam out of underdevelopment country group and becoming a middle-income developed country. However, the efficiency, quality and competitiveness of the economy are still low, not keeping pace with other countries in the region and not commensurate with the country's potential. The risk of falling further behind economically is still there. Therefore, for Vietnam today, in order to successfully implement the path of industrialization and modernization and have a "shortened" development step, it requires us to make efforts to promote the inherent advantages of the country, making the most of every possible opportunity and ability to quickly reach an advanced technology level; taking advantage of the application of more and more, at a higher level and popularizing new achievements in science and technology, "step by step developing the knowledge economy". It can be said that the knowledge economy is a very favorable opportunity for Vietnam to "take a shortcut", gradually narrowing the gap, catching up with

developed countries in the world. We need to accelerate industrialization, associated with the development of the knowledge economy, "forming spearheads of development according to the advanced level of world science and technology" (Communist Party of Vietnam, 2008, p.295). That means both rapidly developing the productive forces, at the same time building appropriate production relations in accordance with the socialist orientation, giving full play to the strength of the whole nation with the strength of the times, making full use of all internal and external resources, bringing into play the intellectual resources and spiritual strength of Vietnamese people; taking the development of education and training, science and technology as the foundation and driving force for fast, effective and sustainable development.

Industrialization and modernization are the inevitable path to bring the country out of poverty and backwardness. But in the world, not all countries are successful in carrying out the process of industrialization and modernization without appropriate models and steps. In principle, the following countries require shortening the implementation time of the contents of the industrialization process. In fact, the implementation time of industrialization and modernization of the following countries is often shorter than that of the predecessor countries. For example, the US and Western European countries take about 100 years to complete industrialization, Japan takes about 50 years, the NICs¹ only need 30-40 years.

Reality shows that science - technology is the foundation of the process of industrialization and modernization and plays a decisive role in determining the country's competitive advantage and development speed. The rapid development of science and technology, especially from the mid-twentieth century until now, is thanks to the remarkable progress in information technology, which is spearheaded by electronic computers. It is thanks to the revolution in science - technology in this field that technology has made a leap, changing the industrial substrate and many fields of production and social life, creating a great premise to accelerate the process of industrialization and modernization step by step to develop the knowledge economy in many countries.

It is the explosion of information, knowledge and technology that people have created modern machines and those machines have helped people multiply their creativity. Thus, the actual creation of wealth depends very much on the level of science and the advancement of technology as well as the application of science in production. The boundaries between science and technology and production, between laboratories and production workshops, and between researchers and knowledge workers are gradually being erased. Thanks to that, knowledge is becoming a direct productive force, a decisive factor of a new productive force. Knowledge is confirmed to be the main

¹ NIC: Newly Industrialized Country

driver of growth, wealth creation and employment in all branches of the knowledge economy (an economy based mainly on human knowledge).

Nowadays, the rate of dissemination of new knowledge, advanced techniques and technologies is taking place rapidly through many different forms and channels of information, and the most common one is technology transfer. Faced with that situation, with the advantages of the following countries, Vietnam has taken advantage of applying the latest technological achievements to economic development, shortening the process of industrialization and modernization. Industrialization in Vietnam must carry out two processes: transition from an agricultural economy to an industrial economy and from an industrial economy to a knowledge economy. In developed countries these two processes follow each other, while in Vietnam these two processes are interlocking and supporting each other.

Thus, industrialization, modernization and development of the knowledge economy is a vast and complex process, including the following basic contents:

Firstly, sequentially develop advantageous industries and focus on developing spearhead industries to develop the knowledge economy.

Industrialization and modernization in Vietnam has both a sequential development step and a leap, in other words, Vietnam's economy develops at two speeds: on the one hand, industrialization must be accelerated, modernize agriculture and rural areas, improve production capacity of basic industries, solve basic and pressing needs of people, create jobs, etc. On the other hand, Vietnam must develop strengthen knowledge-based, high-tech economic sectors such as information technology, materials technology, energy technology, etc. to create many new industries, new jobs achieve high growth rate, and integrate effect on the world economy.

The development of the knowledge economy in the process of industrialization and modernization involves leaps and bounds, but sequential steps must still be respected, the core issue is choosing a reasonable field to apply in each step and combine them optimally. In the current stage of accelerating industrialization and modernization, it is necessary to develop industries with absolute advantages in terms of labor and resources. Thus, in order to shorten the development gap in industrialization and modernization in Vietnam, it is necessary to first increase the expansion of advantageous industries, mainly focusing on industries that use a lot of labor and resources. The strong development of these industries is not only an urgent requirement of the situation of labor surplus and underemployment, but also suitable with the condition that the labor quality is basically low.

Therefore, industrialization and modernization associated with the development of the knowledge-based economy is not simply focusing resources on the development of industries and fields with high knowledge content, but also paying attention to development. labor and resource intensive industries.

Industrialization and modernization associate with the development of the knowledge-based economy. In addition to developing industries with absolute advantages in terms of labor, the country must also devote appropriate resources to rapidly develop spearhead economic sectors based on knowledge with the latest technology in order to create new breakthroughs, achieve high growth rate and quality, and effectively integrate into the international economy, including the following specific industries:

Firstly, the information technology, in which the development of the national information network and the widespread application of information technology in all fields become one of the most important factors of socio-economic development, and ensuring security - national defense. The development of information technology in the development of Vietnam's knowledge economy is considered one of the top priorities in the development strategy. In which, the combined development of hardware and software of information technology is the focus of unleashing the material, intellectual and spiritual strength of the whole nation, promoting innovation, rapid and modern development. economic sectors, strengthen the competitiveness of enterprises, improve the quality of life of the people, it is necessary to increase the ability to take shortcuts to successfully implement the cause of industrialization and modernization. .

Criteria for evaluating information technology to become a spearhead economic sector must have the highest annual growth rate compared to other regions; having an increasing rate of contribution to the GDP growth of the country. Therefore, the 2001-2010 socio-economic development strategy defines: "*Developing high-tech industries, especially information technology, biotechnology and new material technology. Developing a national information system on human resources and technology*" (Communist Party of Vietnam, 2008, p.644.)

Secondly, rapidly develop biotechnology industries (high-tech agriculture, pharmaceutical industry and environmental protection, etc.), create new varieties of plants and animals with high yield and quality and high economic efficiency, practical contribution to economic restructuring; creating technologies for the production of plant and animal protection preparations; technologies for preserving and processing agricultural - forestry - fishery products for export and for domestic consumption. Towards reducing imports, self-sufficient in an important part of raw materials for making essential medicines for the people, widely applying biotechnology in the work of protecting and overcoming environmental pollution.

To develop biotechnology reaching advanced technology levels in the region; to build the biological industry into a high-tech economic - technical branch, which can produce a number of key products, contributing to the growth of the national economy.

Thirdly, develop new material technology industry. The general trend in research and use of materials is to reduce the amount of materials needed to produce a unit of

product. This reduction is achieved through two types of innovations in new and material-saving technology. New materials are varied and are transformed from one form to another before reaching the final product for human use. During the process, the material becomes a waste that can be partly recycled to convert into useful products.

The process of industrialization and modernization in Vietnam cannot be without new materials, so the role of material technology is very important. The creation of new materials with good performance and applications is diverse, such as polymers, metals and alloys, crystal ceramics, organic composites, diamond and superhard materials, electronic and optical materials, atomizers, energy-modifying materials, advanced magnetic materials, and nanostructured materials.

Material technology in the knowledge economy is not only the creation of new materials, but also pre-existing materials, but in the process of using new knowledge, applying principles of new science, new technologies to get more features and advantages than before.

Fourthly, the energy technology industry must be developed. This is the basic technology to solve the very complex problems of the coming period when fossil energy sources are threatened with depletion and the pollution caused by emissions from the processing and consumption of energy has a negative impact. Greenhouse effects change the global climate, leading to many disasters for people and for the earth. Vietnam has quite large and diverse energy potential such as coal, oil, solar energy, etc. Therefore, in the process of industrialization and modernization associated with the development of the knowledge economy, the application of Modern science and technology creates new energy on the basis of exploiting and using natural energy sources effectively, reducing imports is becoming urgent task. In which, taking advantage of and exploiting available raw materials, using quality equivalent or close to imported goods at only one third or half price becomes the goal of developing Vietnam's energy industry at present.

Fifthly, to develop mechanical technology and automation industry. The process of industrialization and modernization also means the process of achieving widespread use of modern technology and techniques in all stages and fields of the economy. In order to create high-quality products, meet the strict requirements of customers and compete effectively in the world market, it is necessary to innovate technology, to replace old and outdated technology with new technology, advanced - automate the production process. Machine automation is increased at the level of information processing, which helps workers no longer be tied to machines as before.

Thus, if industrialization is the way to develop the country, then mechanical engineering is one of the fundamental industries, playing an important role in economic development and strengthening national security. Therefore, the mechanical engineering industry must be developed effectively and sustainably on the basis of promoting all domestic resources

in combination with external resources. Focus on developing a number of specialized products and key mechanical products in order to exploit and bring into full play the potential to meet the basic requirements of the country's development. Strengthen self-research and manufacturing capacity, and at the same time accelerate the acquisition and application of advanced science and technology, creating more highly competitive mechanical products. Improve the ability to specialize, cooperate, improve the capacity of the mechanical industry, creating a premise for the development of other industries of the country. The mechanical engineering industries have switched to using the latest technologies such as new materials and digital technology to manufacture program-controlled machine tools with automatic equipment lines and modern means of transport. Then the value can be increased many times, thereby, gradually developing the knowledge economy.

The above technologies are high technologies that are modernizing traditional manufacturing and service industries, creating new industries with high added value, accelerating the economic transformation towards a knowledge economy

In summary, on a general level, industrialization and modernization together with the development of the knowledge economy in Vietnam now need to initially develop a number of industries with high science and technology content, invest in capital is selectively large, but it is necessary to focus on strongly developing labor-intensive industries in a certain period of time. Then gradually move to industries and fields with higher science and technology content.

Firstly, the economic structure and the intellectualization of the economic structure. Economic structure is the total of balanced relationships in terms of quality and quantity between the constituent parts of the economy in a given time and under certain socio-economic conditions.

Secondly, the essence of industrialization, modernization and development of the knowledge economy in Vietnam is economic restructuring towards knowledgeisation. The requirement of the process of industrialization and modernization of the knowledge-based economy is not only to renovate all industries, but also to restructure in each industry towards the whole economy in the direction of increasing the content of goods and services. knowledge, create more value. All industries have innovation and structural adjustment strategies, which are demonstrated:

Since the process of industrialization is a special stage of development in the economic development of any country in which the basic content is the transformation of the entire production from a small production based on technology. From traditional technology to an industrial production base on the basis of modern technical technology, in the period of industrialization, the economic structure had a very strong change. Whatever form the process of industrialization takes, the most significant structural change of this process is still the change in the proportion of the

traditional, low-productivity agricultural sector, which accounts for the majority of the population in the economy to an economy with a higher proportion of productive industries and services.

Today, the strong development of modern science and technology has promoted the process of economic restructuring, making the production force develop many new professions, and many new jobs are created, especially in the field of manufacturing industrial and service sectors. Since then, a number of new economic sectors have emerged, formed from the combination of a number of industries and services to create new products with high knowledge content. Agriculture's share in GDP is gradually decreasing, although agricultural output is constantly increasing, meeting higher requirements on output and quality for people. Traditional agricultural production will be replaced by modern agricultural production with the effective help of advanced scientific and technological achievements.

The fastest growing fields are the knowledge-based manufacturing and service industries. The production sector is no longer the main sector, the service and high-tech sector becomes the main one, because this sector creates the most added value. Relying on information processing and the creation of information and knowledge, the service industry has become the most important resource in the knowledge economy, playing the most important role in economic growth.

In the context and general development trend of the world, which is currently in the transition from an industrial economy to a knowledge economy, based on Vietnam's specific conditions, it is necessary to have quick thinking, more creative and comprehensive in industrialization and modernization, especially when elements of the knowledge economy appear. Industrialization must be associated with the important contents of transforming the economy from a state of outdated handicrafts with low productivity, quality and efficiency to an economy with high productivity, quality and efficiency. In which, it is necessary to rapidly develop knowledge-based industries and services, creating a premise for economic restructuring towards rapidly increasing knowledge-based economic sectors. Here, the economy not only applies new achievements of science and technology, but also has the ability to create new technologies.

Economic zone structure is also implemented on the basis of restructuring each industry, each field, each product, implemented in the territory in association with promoting the formation of a reasonable economic structure in each region, so that regions can redistribute production forces, bring into play the comparative advantages of each region, especially develop the key economic regions in the South (including Ho Chi Minh City).

Thus, industrialization, modernization and development of the knowledge economy are characterized first of all by the economic restructuring towards the development of high value-added economic sectors that rely heavily on knowledge, old economic

sectors will be replaced by software industry industries with high knowledge content. In order to achieve a desired economic structure in the coming time, priority policies for high-tech industries must be determined; building and developing hi-tech parks, developing spearhead technology industries, software technology industries on the basis of modernizing information infrastructure, investing in educational development, etc. Factors such as information, education, and knowledge will be considered as new industries and increasingly play an important role in the knowledge economy, transforming the structure of traditional industries. The knowledge industry, also known as software production technology, will gradually develop and separate from the traditional industrial sector to become a new industry. In the not too distant future, there will not only be three areas of agriculture, industry and services, but also the field of software technology, also known as knowledge technology, until then, the proportion of agriculture and industry will only accounts for a small part compared to the proportion of services and software technology in the knowledge economy.

Secondly, shifting the labor structure towards intellectualization. Industrialization and modernization associated with the development of the knowledge-based economy causes the economic structure to shift towards knowledge and thereby to shift labor towards knowledge. Labor structure is understood as the division of the labor force according to certain proportions, reflecting its relationship in the overall structure of the economy, in which the qualifications of workers are raised with the requirements of key industries and moving towards increasing knowledge. Labor restructuring on the one hand must ensure objectivity, and on the other hand bring positive results, so labor restructuring is understood as a process of transformation, objective transformation with natural circle from the old labor structure to the new, more advanced labor structure, suitable to the process and development level of the economy in each period (Cuong& Tien, 2004, p.59).

The economic and labor restructuring towards industrialization and modernization associated with the development of the knowledge-based economy requires rapid development of high-quality human resources, training of a powerful force, not only including professionals (manager workers, researchers, experts), but also technologists, technicians, highly qualified professional staff, skilled technical workers, technical workers of high level. In the conditions of modern science and technology, each working position and title in the production line may require technical workers at different levels, including college and university degrees under the current technical training system.

In the process of industrialization and modernization associated with the development of the knowledge economy, the economic structure shifting towards knowledgeization will lead to the knowledgeization of the labor structure, the tendency to shift the labor structure such as after:

Thirdly, reduce the proportion of agricultural workers, increase the proportion of industrial, construction and service workers. Increase the proportion of laborers engaged in the production of goods and services for domestic and export markets. To liberate labor in industries with low labor productivity and labor value, to shift to industries with high labor productivity and labor value through the application of new and modern science and technology. Increase the proportion of employees in industries and fields that require workers with increasingly high levels of culture and trained workers, including professional and technical workers, in order to increase the intellectual content in the high quality products and services.

The trend of labor shift mentioned above comes from the liberation of production power and labor force, but when economic development, it also requires a team of workers and knowledge to meet new requirements.

The labor structure in the knowledge economy has an increasing tendency to shift from a narrowly trained workforce with only a few occupational skills to one that is trained in many skills, especially new skills. High technology application requires the application of information technology, automation equipment, product quality inspection according to ISO international standards, especially technical workers must also have skills in handling and processing technical and technological problems, and teamworking skills.

Thus, in the modern world, we are more and more aware of the decisive role of human resources in development, especially high-quality human resources. It is an internal resource, an endogenous factor and a great driving force for the development of the knowledge economy. When transitioning to a modern economy, high-quality human resources are an important part of human resources who directly comprehend and apply scientific and technical advances and new technologies. High-quality human resources become an inner force, taking the lead in the cause of industrialization, modernization and integration. Developing high-quality resources is a breakthrough solution to successfully realize the shortened industrialization and modernization cause.

There is a dialectical relationship between industrialization and modernization and the scientific and technological revolution and the knowledge economy. From a theoretical point of view, the development of human society is a process of "natural history" (Marx & Engels, 1995, p. 21) as K. Marx once summed up. Human society moves from low to high, the latter is always more developed than the former. However, in that development process, people cannot subjectively create their own history. Each country must build on the basis of material production in the country and in the world to build an appropriate socio-economic form. That movement follows, is governed by objective laws. Humans can only perceive and apply those objective laws. Thus, from a theoretical perspective, according to the sequential development of history, industrialization must take place first before there is a basis

for the development of the knowledge economy. However, in practice, there are countries due to objective historical conditions that can shorten some certain historical periods, advancing to a higher historical stage in one form or another. That "shortening" development process is only a natural-historical process, also regulated by the material production base and subject to objective laws. Industrialization and modernization with the knowledge economy have an organic relationship with each other, in which, industrialization and modernization are the stages of building a material foundation, which is the basis for the knowledge economy to form and develop. The development of the knowledge economy will promote the process of industrialization and modernization to take place at a faster and stronger speed. There is a common element between these two development processes, through which development can integrate the two. They are all based on scientific knowledge (or science for short). The development of science and technology is the premise and condition to promote these two stages of development (from the agricultural economy to the industrial economy and from the industrial economy to the knowledge economy). At the same time, it is the development of science and technology that has brought opportunities for the following developed countries, including Vietnam, to realize "*shortened*" development. We need to have a reasonable development strategy, which can both develop sequentially and "*take a shortcut, take the lead*", in essence, to develop the production force with increasingly high quality and capacity, while productivity, quality, and production efficiency are increasing. Although the knowledge economy was formed in developed countries and has completed the industrialization process, in Vietnam today, if we soon enter the knowledge economy, our development will be faster, catching up with the level of developed countries.

Conclusion

The knowledge economy is a new phenomenon that has appeared since the end of the twentieth century, but has made rapid progress in developed countries and is affecting all other countries in the world. The knowledge economy is a new stage of the development of productive forces, which is an opportunity but also a challenge for the development of every country in the world. Although that path is not easy, it is an opportunity to have breakthrough developments, shorten the process of industrialization and modernization. Today, many countries around the world have strategies to develop the knowledge economy in their own ways that are suitable for their specific conditions. Developed countries gather and attract intellectual workers, scientific and technological achievements in many countries, conduct in-depth research in the fields of new energy, new materials, biochemistry, space exploration, etc. To develop the economy, Vietnam is facing two possibilities: either by taking advantage of the opportunity and having the right and creative development directions and strategies, it is completely possible to rise up and soon overcome the slow

development situation to keep up with the developed countries, but if it does not seize the opportunity, it will fall further and further behind. In the process of integration and development, Vietnam has achieved certain successes.

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