

NEW PRODUCTIVE FORCES IN THE ERA OF VIETNAM'S NATIONAL RISE

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Abstract: Starting from Karl Marx's thesis that "the hand-mill gives you society with the feudal lord; the steam-mill gives you society with the industrial capitalist", the author argues for the role of the new productive forces brought about by the modern scientific and technological revolution in driving the strong development of our country in the era of national rise.

Keywords: New productive forces, era of national rise, Vietnamese nation.

1. Society has come into being, evolved, and developed ever more vigorously in step with the formation, evolution, and development at various levels of the productive forces of humanity, from low to high, from less perfect to ever more advanced. According to Marxism, society is the totality of all social, political, and spiritual relations of people, founded on a specific form of organizing and managing production. Specifically, on this matter, Karl Marx wrote: "The social relations are closely bound up with the productive forces. By acquiring new productive forces, human beings change their mode of production, and by changing the mode of production, they alter the manner of earning their living, thereby changing all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill gives you society with the

industrial capitalist" (Marx and Engels 1995, vol.4: 187).

Thus, what differentiates the various societies in human history is *not what* they produce, but rather *how they produce*, by what means and tools. That is, according to Marx, every transformation of social life ultimately originates from changes in the productive forces first and foremost, the instruments of production.

Unlike the idealist standpoint of the German economist Friedrich List (1789–1846), who regarded productive forces as having a "spiritual essence" and being infinite, Karl Marx asserted categorically that *productive forces* are not of some "spiritual essence", but are instead *real material forces* created by human beings.

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The concept of “*productive forces*” is one of the central concepts of historical materialism. Marx convincingly argued that all changes in social life, in the final analysis, stem from the transformation, the increasing perfection, and the unceasing development of the productive forces. The productive forces provide the material preconditions for the existence and development of human society. They are also the fundamental criterion by which to assess the progress of a society in any given historical stage. Productive forces comprise the laborers and the means of production. Today, science and technology themselves have become direct productive forces, as they are the immediate cause of transformations in the production process and constitute an indispensable component of modern social production.

For Marx, the productive forces of society represent the practical capacity of human beings to transform nature in accordance with predetermined human purposes. In the act of producing material wealth, human beings employ tools of labor created by previous generations to act upon nature, reshaping it according to their goals and intentions, thereby creating material wealth to satisfy essential human needs. In this very process, people gradually come to recognize the laws of nature, and thus, through their hands and minds, achieve ever greater effectiveness in bending nature to serve human life. This is the process of producing material

wealth. This process of material production must constantly change, and therefore, the productive forces cannot remain static or unchanged; they are by no means immutable. Rather, they undergo continuous renewal, constant perfection, and development to ever higher levels. On this point, Marx made clear: “History is nothing but the succession of separate generations, each of which exploits the materials, the capital, the productive forces handed down to it by all preceding generations; thus, on the one hand, it continues the traditional activity in completely changed circumstances, and on the other, it modifies the old circumstances with a completely changed activity” (Marx and Engels 1995, vol.3: 65).

The development of productive forces in modern society is unfolding at a pace “one day is worth twenty years”, just as Karl Marx once predicted and in some fields, even faster thanks to the modern scientific and technological revolution, with the ever-accelerating advances of human knowledge.

In his time, the scientist and philosopher Francis Bacon (1561–1626) asserted that “knowledge is power”, and that “human knowledge and human power are the same” (Bacon 1972: 12). In our era, however, during this revolution, no branch of material production can survive let alone develop without knowledge. Today, “knowledge has become an essential input for enterprises”; “knowledge can substitute for other resources; it is inexhaustible,

never depleted. Knowledge is a substitute for everything". If "knowledge is essentially inexhaustible" (Alvin Toffler 1991: 125, 120, 41), then by contrast, "land or machinery can only be allocated to one individual at one place and time; but knowledge can be used simultaneously by many people" (Alvin Toffler 1991: 91).

As we all know, Marx highly valued the role of science in material production in general and in the development of productive forces in particular. On this matter, he wrote: "The development of fixed capital indicates to what degree general social knowledge ['Wissen knowledge'] has become a direct productive force, and hence to what degree the conditions of the process of social life itself have come under the control of general intellect, and been transformed in accordance with it; it also shows to what degree the social productive forces have been created not only in the form of knowledge, but also as immediate organs of social practice, direct organs of the real life-process" (Marx and Engels 1995, vol.46, Part II: 372). Based on these arguments, Marx showed that scientific knowledge, when embodied in fixed capital such as factories and machinery used in production, becomes a direct productive force. In other words, scientific knowledge, once applied and materialized into machines and tools of production and used by workers in the labor process, itself becomes a direct productive force.

However, for quite a long time,

the role of knowledge was doubted, debated, and sometimes contested. Some even feared that embracing the knowledge economy would deviate from orthodox Marxist views! In fact, to truly enter the orbit of a high-level knowledge economy requires appropriate investment on many fronts especially in the training of high-quality human resources, including experts at the most advanced levels. This means the state must adopt a sound strategy, calculated with the utmost scientific rigor and high feasibility. Time does not allow hesitation or delay; we cannot afford to be too slow, lest we fall further behind the world.

We must also realistically acknowledge that at present, our country simultaneously exists within the *first wave* (i.e., the agricultural civilization, based on biological energy or "living batteries"), the *second wave* (i.e., industrialization and the industrial civilization, one of whose essential conditions was energy derived from coal, steam, and oil in general, non-renewable fossil fuels), and the *third wave* (i.e., post-industrial civilization, enabled by the emergence of a series of new technologies, with information as its core). This means that we must *still utilize and integrate* the achievements of all scientific, technical, and technological revolutions that humanity has undergone and continues to undergo in order to develop our productive forces. However, this does not mean that the components of our productive

forces today are evenly advanced across all three waves.

If we consider the level of the productive forces as reflected in the tools of labor, the means of production, the materials, equipment, energy, and power employed, as well as in the education, experience, and skills of human beings including the level of scientific and technological application in production we can immediately see that in our country today there exists both disparity and, at the same time, a clear interweaving of all these waves. However, these disparities must be overcome, and the interweaving must be used effectively to move faster and further in developing new, modern productive forces.

2. Productive forces consist of the means of production and human labor power employed in production. The means of production comprise instruments of labor and objects of labor. In our era, the productive forces of humankind are undergoing profound, revolutionary transformations ranging from labor power to means of production. The transformation of social productive forces has been, and continues to be, accompanied by changes in the economy's functioning. It can be said that today, the "traditional" economy is gradually being replaced by the "digital economy". From this process, the term "new productive forces" has been employed by scholars to designate newly emerging industries

formed on the basis of scientific and technological innovation and breakthroughs. Recently, the term "*new productive forces*" has also been used frequently by Chinese authorities as a solution for promoting sustainable economic recovery and growth. "New productive forces" are regarded as drivers of innovation, enabling the development model to move beyond traditional economic drivers toward the formation of the digital economy. This is an economy that operates mainly on digital technology, particularly electronic transactions conducted via the internet also known as the internet economy, the new economy, or the web economy.

In fact, the concept of "*new productive forces*" was already mentioned by many scientists as early as the mid-20th century, when much discussion centered on new *factors and new components* within society's productive forces such as the use of new forms of energy: nuclear energy, wind energy, solar energy, geothermal energy, tidal energy, and so forth. These new energy sources were expected to gradually and progressively replace traditional ones, such as coal and petroleum, which had been causing severe environmental pollution and worrisome global warming.

Much has also been said about new materials and high-tech industries. However, in today's Fourth Industrial Revolution, the constituent elements of the new productive forces especially

instruments of production are being constantly enriched, particularly in terms of quality and efficiency. For our country, improving the quality of these instruments, especially through digital transformation, has identified science and technology as the foremost drivers for developing modern productive forces and advancing our nation into a new era *the era of national rise*.

The Fourth Industrial Revolution, which we are now witnessing and in which our country has already begun to participate actively is unfolding worldwide at an extraordinary speed in key areas, such as the semiconductor industry, artificial intelligence technologies, and, especially, information technology. What deserves particular attention is that as these fields develop intensively in many countries, they are giving rise albeit in the initial stages to a growing workforce equipped with digital thinking and digital skills. Humanity is now witnessing truly remarkable developments of our time: the emergence of productive forces in the digital-technology era, such as *artificial intelligence (AI), the Internet of Things (IoT), Big Data, Cloud Computing, and Blockchain technology*. All of these are gradually becoming essential instruments of production in many new industries across diverse sectors of social life.

In many countries, infrastructure especially digital infrastructure is being heavily invested in and rapidly developed. At the same time,

telecommunications networks and broadband internet have been widely deployed, providing an essential foundation for the development of the digital economy and digital society. It must be clearly recognized that, if we are to lead the country into the new era the era of national rise one of the most important drivers for developing productive forces must be digital transformation. As General Secretary To Lam has written, digital transformation is “a crucial driver for developing productive forces and perfecting relations of production, bringing the country into a new era” (To Lam 2024).

First of all, let us talk about *Artificial Intelligence (AI)*.

AI is revolutionizing many industries by automating processes, optimizing supply chains, and improving customer service. A remarkable milestone in our country was on January 26, 2021, when the Prime Minister issued Decision No. 127/QĐ-TTg on the *National Strategy for Research, Development, and Application of AI until 2030*. The purpose of this strategy is to promote research, development, and application of AI, making AI a key technological field of our country in the Fourth Industrial Revolution, thereby creating a breakthrough in Vietnam’s AI development, contributing to socio-economic development, and gradually making Vietnam a prominent AI hub in the region and the world. In fact, AI has already been applied and developed in various fields in Vietnam, including

healthcare, education, agriculture, transportation, and e-commerce. For instance, AI has been applied in endoscopic image diagnosis, helping to automatically detect, localize, and assess the severity of lesions in patients' digestive systems. AI is also involved in smart cities and e-governance, or helps people summarize and analyze hundreds of pages of documents within just a few seconds.

However, on the broader international level, it is necessary to properly recognize both the positive role of AI in promoting the development of productive forces and the legitimate concerns about its potential downsides. According to experts, the most significant contribution of AI to society is its enormous capacity for analysis, particularly its ability to process vast amounts of data at high speed and efficiency. This not only improves productivity but, more importantly, creates a new mode of production, thereby contributing to the advancement of the productive forces.

At the same time, some world-renowned scientists have raised concerns about AI's darker side. For example, the eminent physicist Stephen Hawking (1942–2018) once warned that *AI could mark the end of humanity once it reaches its highest stage of perfection.*

Similarly, Andrew Maynard, physicist and Director of the Risk Science Center at the University of Michigan (USA), argued that “when AI combines with nanotechnology, it

could be a breakthrough in science, but it could also be the greatest threat to humanity. For example, the U.S. Department of Defense is researching the Autonomous Tactical Robot (EATR) project, in which robots would use *nanotechnology* to absorb energy from organic materials including possibly the human body. This would be the greatest threat, as nano-robots could generate energy by consuming organic matter from plants, *animals*, and *potentially even humans*. This may sound like something out of a science fiction movie, but it is entirely possible. Perhaps we should begin to be cautious right now” (cited from Wikipedia, November 2023).

From a social perspective, another widely acknowledged concern is that AI may significantly increase unemployment rates. Specifically, once AI becomes highly advanced, it has the potential to replace humans in many intellectual and detail-oriented jobs, such as healthcare, automated assembly-line production, and office work.

Moreover, criminal groups are also exploiting technological advances to conduct large-scale money laundering and online fraud schemes that are difficult to detect. Indeed, these “criminal enterprises,” powered by AI, have been developing at a faster rate than government agencies can counter them. AI technologies enable criminals to enhance fraud through the use of audio and video deepfakes and facial-swapping software. According

to a report in early November 2024 by the United Nations Office on Drugs and Crime (UNODC), Telegram and cryptocurrencies are the most commonly used tools in this “criminal services economy”. The report showed that deepfake-related crimes in the Asia-Pacific region increased by more than 1500% between 2022 and 2023, while facial-swap scams rose by 704% in the second half of 2024 compared to the first half.

Regarding the Internet of Things (IoT), or the ecosystem of connected devices:

IoT is defined as “the global infrastructure for the information society, enabling advanced services (computing) through interconnecting physical and virtual things based on existing and evolving information and communication technologies.” IoT refers to the network that gathers smart devices and technologies, facilitating communication between devices and the cloud, as well as communication between devices. The emergence of increasingly affordable computer chips and the growing availability of broadband telecommunications have enabled billions of devices to be connected to the internet.

The Internet of Things integrates “things” with the internet every day. Integration costs may increase connectivity across many everyday items, such as light switches. As a result, an entire industry has emerged centered on equipping homes, businesses, and multifunctional offices with IoT

devices. These smart devices can automatically transmit and receive data over the internet. All these “invisible computing devices” and their related technologies are collectively referred to as the Internet of Things¹.

Cloud Computing has also been rapidly developing in Vietnam in recent years and has been applied across various fields, including information technology, finance and banking, education, tourism, and hospitality. As in many countries around the world, Vietnam’s infrastructure-

¹ “Internet of Things Global Standards Initiative.” Archived on July 13, 2017. In Vietnam today, the Internet of Things (IoT) technology major is offered as a full-time undergraduate program at: Hanoi University of Science and Technology: under the title Smart Embedded Systems and IoT as part of the advanced program. Posts and Telecommunications Institute of Technology (Ho Chi Minh City campus): since 2022. The program lasts 4.5 years (9 semesters), including 8 semesters of coursework at the institute and 1 semester of practical internship at enterprises. At the end of the program, students either complete a graduation thesis or fulfill substitute graduation modules. The main difference between the IoT technology major and the majors in Telecommunications Engineering or Information Technology is that IoT students are selectively equipped with knowledge and skills in three interconnected areas: Electronics (sensors), Telecommunications (connectivity and cloud systems), Information Technology (programming). This interdisciplinary approach enables them to design and build a complete IoT system. Other universities in Vietnam do not offer IoT as a separate major but as a specialization within existing programs: FPT University: IoT specialization under the Information Technology major. Posts and Telecommunications Institute of Technology: IoT specialization as one of three specializations under the Telecommunications Engineering major.

especially digital infrastructure is being increasingly invested in and strongly developed. The nationwide expansion of telecommunications networks and broadband internet coverage is laying the foundation for the development of the digital economy and digital society. All of these revolutionary changes belong to the realm of labor tools and means of production.

Blockchain technology is also gradually becoming a technological pillar in Vietnam, with numerous promising applications, including platforms for storing diplomas in education and training, letters of credit, business contract guarantees, and payments in the banking sector. It can be said that all the components making up the new instruments or means of production have already taken shape and are gradually maturing in our country.

However, the most crucial element in the structure of the productive forces- at any stage in human history-remains *human beings*, as Karl Marx once pointed out.

In this era of industrial revolution, modern industries require workers with appropriate levels of competence. Specifically, workers must be able to master advanced technologies and techniques to operate modern machinery and equipment. Furthermore, they must possess specialized knowledge and skills, along with essential soft skills such as creative thinking, proactiveness in all tasks, computer literacy, the ability to access

necessary knowledge from the internet, strong foreign language proficiency, teamwork skills, the ability to maintain high concentration at work, adherence to labor discipline, time management skills, and especially, the ability to quickly solve newly arising problems.

Thus, the profound transformation of the components of the new productive forces demands corresponding and timely changes in living labor. Therefore, the State must focus on developing human resources that match the requirements of advancing the components of the new productive forces, because, ultimately, in the productive forces of society, “human resources are the most important” (Nguyen Phu Trong 2022: 52), as General Secretary Nguyễn Phú Trọng has affirmed.

Conclusion

In summary, the productive forces create the material foundation for the existence and development of human society. They are also the fundamental criterion for assessing the progress of a specific society in each historical stage. It must be clearly recognized that if we wish to bring our nation into a new era the era of national rise we must regard digital transformation as one of the key drivers for developing the productive forces, and consider science and technology as the most decisive force in building modern productive forces. Yet, above all, it is human resources with creativity, acumen, and high-level knowledge that are the

most essential factor.

It is precisely the new productive forces generated by the modern

scientific and technological revolution

that will vigorously propel our country's development in this era of national rise.

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