# II. TECHNOLOGY AND ECONOMY

# 7
# A. Toffler's Civilization Waves and Cycles of Economic Development

**Alexander E. Aivazov**

*The Center for International Studies of G. Arrighi's and N. Kondratieff's Economic Cycles, Orel*

**Vladimir A. Belikov**

*Orel State University*

**Abstract**

*Based on the synthesis of scientific forecasts of the 20th-century scientists, the article considers civilization waves in the history of human development. The authors also define the economic basis for their formation, development and change provided by the formation, development and change of technological paradigms and by technological revolutions leading to the change of paradigms of public management, to the formation and change of systemic cycles of capital accumulation, formation and development of world economic paradigms and their movement to different regions of the world.*

***Keywords:*** *civilization waves, large cycles of economic conjuncture (K-cycles), systemic cycles of capital accumulation, technological paradigms, technological revolutions, world economic paradigm, systems of economic development.*

Alvin Toffler, an American philosopher and futurologist, in his book *The Third Wave*, which was first published in 1980 (Toffler 1999), distinguished three civilization waves in the history of human development: agricultural, industrial and the information waves. The first wave (agricultural civilization) began about 10,000 years ago, when gatherers and hunters learned to cultivate land and moved from a nomadic to a sedentary way of life. The main resource of the first wave was land, and most of the created product was consumed by those who directly produced it. The main energy resources were the forces of nature: water, wind, fire, human and animal muscle power.

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Economic development in the first civilization wave repeated the cycles of agricultural production, 'going around in circles'. China, India, Japan and other Eastern countries were the leaders of agricultural civilization in the period of its extinction in the 18th century, as they could get two or three harvests a year due to favourable climatic conditions, land reclamation and labour intensification. Therefore, 200 years ago, according to Angus Madison, the countries of the East created more than half of the world gross domestic product (GDP), while Europe and America, *i.e.* the West, produced about a quarter of the GDP (Maddison 2008). Capital accumulation took place mainly in trade, with goods mainly flowing from East to West and gold and silver from West to East (Frank 2002).

## The Mechanisms of Development of Industrial Civilization

From the mid-18th century, the second (industrial) wave started to gain strength, eventually spreading across almost the entire world in 100 years. As a result of the Industrial Revolution and aggressive colonial policy of Western countries, the majority of self-sufficient people of non-Western civilizations – leaders of the agricultural wave – became colonized or semi-colonized. This resulted in a loss of potential for economic development due to favorable natural and climatic conditions, outdated technological and organizational principles of agricultural production (the institutions of the first wave), which hindered the rapid development of industrial civilization. Eastern countries, hostage to their natural and climatic advantages of the first wave, ceded leadership in world development to the West.

The basis of any civilization is energy. Agricultural civilization used the renewable energy of muscular power of people, animals and natural resources (wind and water). The industrial wave began to rely on non-renewable natural resources: coal, oil, gas, the extraction of which became a powerful hidden subsidy to industrial society. The technological breakthrough of industrial civilization was the creation of machines which, unlike the mechanisms of the first wave, did not simply amplify muscular or natural force, but did the work themselves, especially after the invention of the steam engine.

The *industrial* wave started to develop not according to the cycles of agricultural production, but according to economic cycles, the main of which were the large cycles of economic conjuncture (K-cycles) discovered by Nikolai Kondratieff and the systemic cycles of accumulation (SCA) discovered by Giovanni Arrighi. Kondratieff's research showed that K-cycles consist of two waves: downward and upward. The downward wave is characterized by 'a special duration of depressions, shortness and weakness of upturns', while the upward wave is characterized by long-term stable growth and short-term recessions (Kondratieff 1989: 208). Therefore, N. Kondratieff's follower J. Mod-

elski, proposed to call the K-cycle downward waves as 'take-off phase', and the upward waves as 'rapid growth phases' (Modelski 2006: 297; 1987).

During the 'take-off phase' or downward wave, a cluster of new basic technologies is formed, which creates the necessary material prerequisites for future growth. During the rapid growth phase, complementary and improving technologies emerge, as well as the diffusion of basic technologies into other sectors of the economy. This leads to the economic growth on the upward wave. Sergei Glazyev called the process of formation of basic technologies and their subsequent diffusion throughout the economy as the formation and development of *technological paradigm* (Glazyev 1993). At the end of the K–cycle upward wave, there is an exhaustion of the technological prerequisites of growth, and the economy falls into a 'technological stalemate' (Mensch 1975). It is characterized by stagnation on a new downward wave, in which the basic technologies of the new technological paradigm begin to form for the take-off phase of the next K-cycle. Then everything repeats again and again.

In each K-cycle (beginning from the 18$^{th}$ century on the downward wave), a change in the basic model of economic development on a new ideological paradigm took place. But this change took place only in the context of two main economic ideologies (liberalism and dirigisme), characterizing the role of the state in the economic life of society. At the stage of the emergence of the industrial wave, mercantilists demanded active government intervention in economic activity in the form of protectionism. But in the period of the first K-cycle, the physiocrats demanded the withdrawal of the state from the economy under the slogan 'Laissez faire, laissez passer' ('Grant freedom to act'), from which A. Smith, who studied physiocrats' doctrine, derived the formula of the 'invisible hand of the market'. And up to the present, in each K-cycle, the model of economic development changes within the framework of the confrontation between liberalism and dirigisme.

Kondratieff cycles characterize the development of the industrial wave in terms of technical and economic changes. *Systemic cycles of capital accumulation* (SCCA), discovered by G. Arrighi on the basis of F. Braudel's research, show how the industrial wave developed in terms of historical and geographical changes, as well as the formation within SCCA of a certain world-system with its core headed by a hegemonic country and periphery, due to which capital accumulation takes place in the core. The formation of a new SCCA happens 'under the umbrella' (F. Braudel's term) of the previous SCCA, but it takes place in another country or even in another region of the world, and its formation and development are carried out within two K-cycles.

The first K-cycle of the systemic cycles of capital accumulation can be termed as the 'take-off cycle' of the world economy, as the capital accumulation is formed, overcoming the technological stalemate, on a new technological basis in the production sphere according to Karl Marx's formula 'M–P–M'.

G. Arrighi called this cycle as the phase of material expansion, as capital accumulation is carried out by expanding and deepening the division of labour and developing the production of material values on a new technological basis. This cycle, as a rule, ends with a crisis of capital over-accumulation, which leads to inefficiency of further capital accumulation in the sphere of production due to the decline in the rate of profit caused by the growth of the organic structure of capital.

Capital starts seeking other spheres of application. In the second K-cycle, which can be called the 'cycle of inertial growth', capital accumulation shifts from real production to the financial sector according to Marx's formula 'M – M', where fictitious capital creates financial pyramids and inflates financial bubbles. G. Arrighi called the second stage of the systemic cycles of capital accumulation as the phase of financial expansion, which ends with a crisis of overproduction due to the contraction in consumer demand (as the share of accumulation increases and the share of consumption decreases) and the collapse of financial markets as a result of the collapse of financial pyramids. The world economy is currently experiencing this phase of historical development, associated with the crisis of overproduction.

But it would be misleading to think that financial capital performs exclusively parasitic function of producing money out of thin air. Its main task is to concentrate and accumulate capital for a new leap in expanding the potential of production capital and redirecting capital into new spheres of production formed by a new technological paradigm. Discoveries and inventions of new products and methods of production occur constantly, but these inventions do not always become innovations, because inventions are feasible ideas that may be economically irrelevant if they are not used in economic activity. But they become innovations, that is scientific discoveries, which have found commercial application, only when financial capital sees them as a source of its future income.

Inventors and founders of innovative enterprises may have brilliant ideas and wish to take huge risks to implement their projects, but if they do not have financial capital, their projects will ever be realized. The same happens in the development of new territories. L. Badalyan and V. Krivorotov (2010: 37) call this process 'the development of inarable areas'[1] Without the Marshall Plan, the reconstruction of the post-war destroyed economies in Europe and Japan would have taken many decades, and without the transfer of 'dirty', labour-intensive industries to China with its cheap labour force, the 'Chinese miracle' would have been simply impossible.

[1] In the framework of their study of human development as the formation, development and change of technocenoses the territories that are unsuitable or hardly suitable for life and food production within the current technological mode are called ' inarable' by Badalyan and Krivorotov.

Production capital brings together agents who create new wealth through the production of goods and the provision of services that are rooted in a particular field of activity and even in a particular geographical region. For productive capital, knowledge of goods, processes and markets is the basis of potential success. Financial capital is independent by its nature, its power is based on the power of money, it can be successfully invested in any firm or any project without much idea of how or what will be done with the invested funds. As a result, financial capital can acquire deposits, stocks, bonds, oil futures, derivatives, gold and diamonds, as the most important thing for it is the expectation of growth. Financial capital itself is divided into *investment capital*, which promotes the development of productive capital, and *speculative capital*, which inflates financial bubbles and creates financial pyramids.

In recent years, speculators and real investors are united under one name – 'investors', but it is absolutely wrong to unite two different forms of financial capital into one concept. They have absolutely different goals in business and ways of income extraction. Real investors prefer long-term investments of their capital and stability of economic development, while speculators are focused on short-term investments in circumstances of high volatility and turbulence of economy. An investor is interested in a long-term perspective of development and should realize the investment horizon, while a speculator is interested in the collapse of the economy and in the manipulation of financial markets.

The best example of the difference between a speculator and an investor is well-known financiers and former business partners George Soros and Jim Rogers. The former is a typical 'piranha' of financial markets, making money on financial cataclysms. For example, in the 1990s he made money by collapsing the English pound sterling, then he contributed to the financial crisis in South-East Asia, the default in Russia, and then took part in the US stock market crisis in 2000 and 2008. The other, on the contrary, avoids crisis situations and only invests where he sees a long-term perspective for the application of his capital. That is why he is called the 'investment guru' and he is the one who coined the famous phrase, 'If you were smart in 1807 you moved to London, if you were smart in 1907 you moved to New York, and if you are smart in 2007 you move to Asia'.[2] This phrase is fully consistent with G. Arrighi's theory of SCCA.

Financial bubbles' burst, collapse of financial pyramids and financial markets trigger the centralization of financial capital, which flows into new technologies and newly emerging industries, as well as into new territories. Thus, the 'development of inarable lands' takes place, which leads to the explosive growth of the world economy. '*Technological stalemate*', or the collapse of financial markets, is the economic violence against capital, the 'creative de-

[2] URL: http://www.innovationmagazine.com/volumes/v10n1/spotlight1.html.

struction' that J. Schumpeter wrote about. At the same time, it is an economic compulsion of financial capital to invest in the real economy. It is no coincidence that in the Chinese language such a phenomenon as crisis is denoted by two characters, one of which means 'problem' and the other 'new opportunities'. This economic violence forces capital to form a new technological paradigm that ensures the transition to a new K-cycle and the formation of a new world economic paradigm in a new territory, which means the transition to a new SCCA.

Thus, *the world economic paradigms* discovered by S. Glazyev (2016) play the same role for SCCA as technological paradigms for K-cycles. They enable the transition of the economic basis of social development to a new, higher level. But before this transition happens, the world economy goes through the phase of *investment stalemate*, when financial expansion still brings a good income, which makes investments in the real economy unprofitable due to shrinking demand, and the uncontrolled growth of financial markets has not yet led to their collapse. The world economy experienced an 'investment stalemate' in the 1920s and 1930s that culminated with the Great Depression, and it is experiencing the same one at the present time, which is known as the 'Great Recession'. As a rule, overcoming the 'investment stalemate' is due to a sharp increase in public investment in infrastructure or in preparation for war (technical rearmament in the military complex).

Successive pairs of technological paradigms form a *technological revolution*, which within two K-cycles forms a new world economic paradigm as the economic basis of the SCCA. The first technological paradigm, within which textile machines appeared, for the completion of the *Industrial Revolution* required the formation of the second technological paradigm which was characterized by the advent of the steam engine and the transition from natural energy resources (water and wind) to coal, as the labour force was concentrated in cities, and production based on water and wind had to be established in rural areas. In addition, the steam engine was more efficient than wind and water power. The third technological paradigm, which provided steel, electricity and chemical production, began to shape the *Industrial Revolution*, which culminated in the fourth technological paradigm, based on the internal combustion engine, assembly line production and the transition to oil as the main energy resource.

During the first two K-cycles, when the *Industrial Revolution* took place, the world economy shifted from the Dutch (merchant capitalism) to the British (industrial capitalism) SCCA, which turned Britain into the industrial center of world development, producing more than half of the world's industrial output by the mid-19$^{th}$ century. The *Industrial Revolution*, which ended in Britain earlier than in other countries, by the mid-19$^{th}$ century had already provided the material basis for the transition of the center of the world economy from East to West. The aggressive colonial policy of Great Britain, the leader of the Western

countries of the 19th century, allowed it to turn the former leaders of the first wave (China and India) into its colonies and to form the British colonial empire 'over which the sun never set'. As a result of the *Industrial Revolution*, by the mid-19th century the *colonial world economic paradigm* was finally formed, with Great Britain as its leader.

The third and fourth technological paradigms, which marked the success of the *Industrial Revolution*, with significant inventions, such as internal combustion engine and assembly line, led to the shift of the center of capital accumulation from Great Britain to the USA. As a result, by the end of the Second World War, *a monopolistic world economic paradigm*, or the American way of peace – Pax Americana – was formed. The emergence of *the monopolistic world economic paradigm* took place 'under the umbrella' of the British systemic cycles of capital accumulation, when the rapid development of railways led to the creation and development of joint-stock companies and the emergence of monopolies. The Great Depression, which resulted from the rapid and uncontrolled development of monopolies, led to the formation of state-monopolistic capitalism, when, on the one hand, the state controlled the regulation of the activities of monopolies and, on the other hand, contributed to their strengthening and foreign economic expansion.

During the transition period from the British to the American systemic cycles of capital accumulation, in the 1930s, three major competing *systems of economic development* emerged in the world economy:

1. The militaristic totalitarian pseudo-market model developed in fascist Germany, Imperial Japan, Italy and Spain.

2. Keynesian market model of state-monopoly capitalism, established in the USA, and after World War II in other developed countries created welfare states everywhere.

3. The totalitarian non-market model of directive planning in the USSR and other countries of the socialist camp.

It was state-monopoly capitalism that provided the exit from the 'investment stalement' of the Great Depression due to a powerful state programme of infrastructure investment and, in the 1940s, due to state investment during the Second World War. The post-war period of development was called the 'golden age of capitalism', as it ensured the highest rates of global development in the history of the industrial wave.

But the foreign economic expansion of monopolies gave rise to transnational corporations (TNCs) and transnational banks (TNBs). This process was particularly intensified during the downward wave of the K-cycle in the 1970s and 1980s, when TNCs and TNBs went beyond state regulation and proclaimed their goal to form global economy beyond the control of national jurisdictions. By the early 1980s, the influence of TNCs and TNBs was so significant that they could establish a neoliberal ideological paradigm of economic develop-

ment and even brought their protégés M. Thatcher and R. Reagan to power in the UK and the USA. In 1989, TNCs and TNBs formulated the Manifesto of the Global World in the form of *the Washington Consensus*, which the West, through its main institutions, such as the IMF, WB, WTO, *etc.*, began to impose on all other states.

But at the beginning of the 21st century the United States started to lose its leadership, as American analysts from Harvard Business School stated in their study *Problems Unsolved and a Nation Divided* (Porter *et al.* 2016). According to the Harvard researchers, U.S. economic development 'peaked in the late 1990s and erosion in crucial economic indicators such as the rate of economic growth, productivity growth, job growth, and investment began well before the Great Recession' (*Ibid*.: 2). 'The U.S. lacks an economic strategy, especially at the federal level. The implicit strategy has been to trust the Federal Reserve to solve our problems through monetary policy' (*Ibid.*: 3).

> The U.S. political system was once the envy of many nations. Over the last two decades, however, it has become our greatest liability. Americans no longer trust their political leaders, and political polarization has increased dramatically. Americans are increasingly frustrated with the U.S. political system. Independents now account for 42 % of Americans, a greater percentage than that of either major party. The political system is no longer delivering good results for the average American (*Ibid*.: 5).

## The Formation of the Integrated World Economic Paradigm

At present, the world is transitioning from the fifth technological paradigm (which originated in the 1970s and 1980s on the basis of formation of microprocessors, personal computers, the Internet, mobile communications, *etc.*) to the sixth technological paradigm, which will complete the *Information and Communication Revolution*. It is on its basis that the integrated world economic paradigm is already being formed as the economic basis of the Asian systemic cycles of capital accumulation (Arrighi 2009). As a result, the center of the world economy is shifting from the West to the East, where more than 60 % of the world's population lives. Thus, at the beginning of the 21st century, a large share of the world economy will once again be formed in the East rather than in the West. The pendulum of the historical development of the world economy has swung back to the East.

Three main systems of economic development have emerged in the current transition period:

1. The neoliberal model of the American 'neocons', which will inevitably lead to the 'dumbing down' of the masses, the 'chipping' of the population and the degeneration of the entire society.

2. The integrated model of a flexible and pragmatic combination of plan and market with strict state control and regulation.

3. Islamic model with the decisive influence of the religious factor embodied in the theocratic state.

The current transition from the fifth technological paradigm to the sixth one, based on information technologies, nano- and biotechnologies, robotics, 3D printers, new technologies in energy, *etc.*, will lead to qualitative shifts in the productive forces of the world community and will complete the Information and Communication Revolution. New technologies of the sixth technological paradigm will give a powerful impetus to the development of the world economy for the next 20–30 years. The formation of new branches of production and diffusion of innovations of that period into old branches will begin, which will ensure the transition to the upward wave of K-cycle already in the 2020s. This qualitative technological leap will create the material base of the integrated world economic paradigm, which will ensure the rapid development of the world economy until at least the mid-21st century. The G20 summit in Hangzhou, China, called for accelerating this process of innovative development in its main documents.

Together with these processes in the productive forces of society, significant changes will occur in production relations, since the center of capital accumulation is shifting from the West to the East. In Asia, an integrated world economic paradigm is already being formed, based on the combination of the advantages of the market economy with the plan-regulating principles of economic management, which are organically inherent in such Asian countries as China, India, Japan, South Korea, Iran, *etc.* In the 1960s Pitirim Sorokin wrote about this,

> The dominant type of an emerging society and culture will be probably neither capitalist nor communist, but a sui generis type, which we will designate as an integrated type. This type will be intermediate between capitalist and communist orders and ways of life. It should include most of the positive values and be free of serious defects of each type. Moreover, the emerging integrated system in its full development will probably not be a simple eclectic mixture of specific characteristics of both types, but a unified system of integrated cultural values, social institutions and an integrated type of a personality that are substantially different from the capitalist and communist models (Sorokin 1964).

Another important factor determining the formation of an integrated world economic paradigm was the rapid development of integration processes in the world economy, occurring in contrast to globalization, promoted exclusively in the interests of transnational corporations and banks (70 % of which are TNCs and TNBs of the USA) in the final phase of financialization of the monopolistic world economic paradigm. In an attempt to keep the monopolistic world eco-

nomic paradigm and the hegemony of TNCs and TNBs in the world economy from final collapse, the USA is trying to create the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP). In our opinion, this should be seen as the last convulsions of the American systemic cycles of capital accumulation that are fading into the past.

Until recently, it has remained unclear where geographically and how the new center of the Asian systemic cycles of capital accumulation would be formed. According to many researchers, at the turn of the 2000s the center of global economic development shifted from the Atlantic region to the Pacific. However, in our opinion, it was taking place within fading American systemic cycles of capital accumulation, under the dominance of maritime powers and US-controlled maritime trade shipping. This uncertainty was removed by Chinese President Xi Jinping in 2013 in Kazakhstan who announced the creation of the Silk Road Economic Belt. This was followed by Russian President Vladimir Putin's proposal to link The Silk Road Economic Belt project (the SREB) with the Eurasian Economic Union (EAEU), and the center of capital accumulation of the sixth K-cycle began to take shape. When in 2016 at the St. Petersburg International Economic Forum (SPIEF) Putin put forward an initiative to create a continental Eurasian partnership based on the conjugation of the SREB and the EAEU with the participation of India, Iran and other Asian countries, the new center of global capital accumulation of the 21st century finally took its shape – it is *continental Asia and Eurasia*.

In March 2015, the Chinese government announced eight 'economic corridors' connecting China with all neighbouring regions: Southeast, South and Central Asia, as well as with Europe, the Middle East and North Africa. According to China's Foreign Ministry, 70 countries have already been drawn into the orbit of this initiative and their number is growing. More than US$ 1 trillion has already been concentrated in 25 Silk Road-oriented funds and banks for future investments for material expansion and the formation of an integrated world economic paradigm. In the near future, Chinese authorities have pledged to invest US$ 4 trillion in countries that will join the project.

At the Eastern Economic Forum in Vladivostok, Japan and South Korea made proposals for active participation in the development of the Russian economy and integration processes with the EAEU. Russia, Iran and Azerbaijan initiated the creation of the International North-South Transport Corridor, which would connect the newly built port infrastructure of St. Petersburg and the Leningrad Region with the Indian city of Mumbai. Russia resumed the Turkish Stream pipeline project with Turkey. Thus, the SREB regional project coordinated with the EAEU development project, like the Marshall Plan that completed the formation of the American systemic cycles of capital accumulation, is becoming a global project for the formation of the Asian systemic cy-

cles of capital accumulation, which will inevitably ensure rapid growth of the world economy in the coming decades.

The implementation of the Chinese-Russian project, which involves not only the construction of roads, but also the interconnection of international telecommunications, standardization, changes in trade and customs rules, the creation of large logistics centers (hubs), *etc.*, is already considered as the foundation of a future economic boom throughout the vast area of Asia and Eurasia. During the formation of the Asian systemic cycles of capital accumulation a new integrated world economic paradigm will be formed. The planned transport arteries will not only facilitate transit traffic from China, India and other countries through Iran, Central Asia and the Middle East to Europe, but will also increase trade turnover, stimulate financial and investment cooperation with the countries of the region. This will provide a powerful impetus to the economic development of the entire region of Asia and Eurasia with a population of four billion people.

The formation of an integrated world economic paradigm with the center of accumulation in Asia is designed to ensure the growth of welfare of the bulk of the world's population through fair and mutually beneficial economic cooperation and equal partnership, which coincides with the Eastern mindset, oriented not on hegemony and leadership, as in the case of the Anglo-Saxons, but on the harmony of interests. Within the British systemic cycles of capital accumulation, the colonial world economic paradigm ensured the well-being of the elite of several metropolitan countries (the core of the paradigm) through direct robbery of the colonies. Pax Americana within the framework of monopolistic world economic paradigm ensured the well-being of the 'golden billion' (the core of the paradigm) through financial robbery and non-equivalent trade with the countries of the world periphery, whose population was five times higher than that of the developed countries.

At present, Western countries' share in world exports is less than one-third, while the share in world imports is about two-thirds. The opposite is true for the countries of the non-Western world: exports exceed two-thirds of world exports, while imports just over one-third. This certainly shows that the trade of the Golden Billion with developing countries is not equivalent. On the other hand, the total external debt of the BRICS countries (leaders of developing countries) is only US$ 2.5 trillion, or 3.75 % of the external debt of all countries in the world, while the external debt of the G7 countries (the core of developed countries) is 18 times higher (US$ 45 trillion) and is 63.9 % of the total debt of all countries in the world. This indicates the financial robbery of developing countries (Sadovnichiy *et al.* 2014).

After the 2008 crisis, the world economy has reached a bifurcation point. The completion of the information and communication revolution will ensure the formation of an integrated world economic paradigm the transition to which

is accompanied by the completion of the American systemic cycles of capital accumulation and the transition to the Asian systemic cycles of capital accumulation, when the center of capital accumulation and, consequently, the center of the world economy shifts again from the West to the East. In the 2020s, the 'take-off phase' of the new K-cycle will pass into the 'growth phase'. K-cycle will turn into a 'growth phase', which will ensure rapid development of the world economy in the new center of world capital accumulation, that is in Asia and Eurasia. And by the middle of the current century, the process of capital accumulation will no longer be necessary for the further human development, and according to J. Schumpeter and I. Wallerstein's forecasts, a new information civilization, about which A. Toffler wrote in his futurological forecast, will finally emerge on the basis of the integrated world economic paradigm.

## The Main Features of the Integrated World Economic Paradigm

Each civilization wave has its own special worldview, its own morality, its own way of life. Moreover, the worldview, principles and institutions of a new wave do not appear evolutionarily from the same elements of the earlier wave, but are formed on the basis of the unique genome of a new civilization. Therefore, the core of different civilizations are different regions of our planet, in this case the East and the West. Due to the fact that the integrated world economic paradigm is transitional, designed to form the third wave or information civilization, it has a complex character, in which different worldviews, moral foundations, ideological principles and ways of life conflict in a bizarre form, as we are currently witnessing.

Capitalism, even within the agricultural wave, was formed on the basis of Protestant ethics, so it is no coincidence that it was *Anglo-Saxon Protestants, who formed the Industrial wave.* They worked hard, honestly and skillfully, saving every penny or dollar to invest in the development of the business, inventing new technologies for the production of goods that allowed them to earn even more (Weber 2006). Therefore, the world factory was first located in Britain (the British systemic cycles of capital accumulation) and then the center of world industry moved to the USA (the American systemic cycles of capital accumulation). But *economic liberalism*, which emerged in France in the 18th century, as it developed, replaced the values of life: now it is not necessary to work hard, honestly and skillfully 'in the sweat of one's brow'. Capitalism created a 'consumer society'; leisure and entertainment, relaxation of all kinds (often in a cynical and perverse form) are now in fashion; any machinations with money, the quality and quantity of goods are allowed, without regard to conscience and honor.

And now, at the beginning of the 21st century, liberalism is no longer needed, because it has done what the 'proletarians of all countries' could not do: it

has buried capitalism. Liberalism became the gravedigger of capitalism, as it destroyed its foundation – the Protestant ethic. And on the ruins of Western capitalism, an integrated world economic paradigm based on the *ethics of the civilizations of the East* began to form within the framework of the Asian systemic cycles of capital accumulation. The industry of a new information wave moved from the West to the East, as Americans, infected with liberalism, stopped working hard, honestly and skillfully, as they did in the early and mid-20th century. But the Chinese, Japanese, Koreans, Vietnamese and other representatives of Eastern civilizations love and know how to work hard, honestly and skillfully. At the same time they are very modest in their needs, just as Protestants were at one time. Moreover, while both Protestant ethics and liberalism are based on extreme individualism and fierce competition, the civilizations of the East are based on collectivism and striving for harmony of interests, which are incomparably more consistent with the requirements of the new wave.

The formation of the integrated world economic paradigm takes place when the world is shaken under the pressure of two waves at once: the declining industrial wave and the emerging information wave, neither of which is dominant at present. The vision of the future slips away and becomes fragmented. In this stormy sea of the most unexpected clashes, the main conflict of our time is being formed – between the coming third wave, carried by the East, and the declining second wave, carried by the West. The internal conflicts of each of them are added to the confrontations and conflicts of supporters and opponents of each of the waves. The integrated world economic paradigm is precisely designed to preserve the best and viable of the previous civilization, transforming it in accordance with the requirements of the emerging new wave.

A. Toffler argued that while the second-wave manufacture is firmly associated with large batches of millions of absolutely identical, standardized products, 'the third-wave manufacture is the short run of partially or completely customized products' (Toffler 1980: 198). Products made to measure or to order in single copies or very limited series symbolize a return to the production principles of the pre-industrial era, but on a new technological basis, on the basis of high technology. Serial conveyor production is gradually replaced by *continuous-flow production with full automated customization of each product*, which is significantly simplified with the advent of 3D printers and other technologies based on infinite programming possibilities. The number of components into which each specific product can be disassembled is decreasing, and the role of the consumer in the production process is increasing.

*The development of computers and communications* creates the preconditions for moving the workplace from the office and factory to the individual home. Social factors will also facilitate the transfer of work to the home. Energy consumption will decrease, and the need for decentralization of energy

sources will increase. This will lead to an increase in demand for small-scale alternative energy: solar panels, wind power, geothermal energy, hydropower, *etc.*, which will contribute to reducing the environmental burden. 'New' industries (information, education, health care, science, services) will benefit, 'old' industrialized industries will lose. Dislocated workers will turn into individual entrepreneurs more often who have their own means of production.

The significance of Internet-based services and consulting will dramatically increase. Even now medicine has announced the possibility of moving the center of communication between doctor and patients from the doctor's office to the Internet. It is not without reason that a quote appeared long ago, 'Prevention is better than cure'. Only emergency work will be left to the inpatient centers, and all preventive work will be left to personal contacts on the Internet. The same can be attributed to the learning processes that are already being developed, including on a distance basis. Even wider are the opportunities for consulting on household and other problems of individual daily demand. This is successfully proved by forums on the Internet, linking car enthusiasts engaged in individual construction by their own efforts, repair of household appliances and other things. A person may well survive in micro-collectives and even due to the widest sphere of computer communications work and serve herself/himself and her/his family.

In the long term, there will inevitably be a breakdown of the mass market into mini-markets, for each of which it is necessary to look for a different solution. And all these mini-markets will exist in a single Internet environment, the prototype of which can be considered the Chinese company Alibaba Group. In this respect, the logistic approach to the organization and management of production and enterprise will be strengthened which originated and became widespread in developed countries in the second half of the 20$^{th}$ century. In the industrial era, it was common to consider a vertically integrated corporation solely as an economic subject. The third wave brings with it the need for a completely new institution – a corporation that not only makes profits and produces goods, but also contributes to solving the most complex environmental, political, racial, moral, gender and social problems. This is what modern society demands.

The third wave destroys the fundamental pillar of industrial organization – the principle of unity of command. It will be replaced by the matrix management, in which the employee has administrative and functional superiors. The third wave will force experimentation with a new type of organization. It may consist of small units that can be connected in different ways in each case, obtaining numerous configurations. A matrix or network organizational structure just fits this type of organization. Besides matrix structures, modern enterprise organization gives fundamentally new organizational structures, which are already in principle suitable for a new information and communication economic

system within the framework of integral world economic paradigm. Adaptive organizational structures can be modified in accordance with the changes in the environment and the needs of the firm itself.

The development of adaptive structures has been of particular interest to the firms whose products have a relatively short life cycle and often change due to the scientific and technological development of the industry, as well as the firms whose field of activity requires extensive research and technical development. The intensifying competition and market dynamism require from the firms increasing innovative efforts, and the inertia of the established organizational-management forms often does not allow for quick adaptation to the changes that occur, which is fraught with a crisis that threatens the very existence of the firm.

While continuing to experiment in the development of their structures, modern companies try to offset the negative effects of hierarchical-bureaucratic organization with the help of network business organizational forms. *The idea of direct communication channels* between relatively equal partners, developed since the early 1960s, led to the construction of network organizations. In a volatile external business environment, *innovation and flexibility of information exchanges* become crucial for success. The rapid obsolescence of information requires the firm to utilize it immediately, but managers are increasingly unable to devote sufficient time to detailed familiarization and personal management and must therefore mostly delegate. In turn, employees have no time to wait for instructions from above or to work out decisions over a long period of time.

This combination of 'grassroots' decision-making, open information exchanges and blurred formal lines of authority is called *a network structure.* The ideal network organization means the structure of a *loosely connected network of fundamentally equal and independent partners*. This logic of inter-organizational cooperation, successfully used in strategic alliances and virtual corporations, is beginning to be transferred to the internal life of a company. The company should create conditions that allow the system to control itself with the help of various feedback mechanisms.

Modern information and communication technologies are only an important condition for the effectiveness of network organizational forms, while the main thing is in social and socio-psychological aspects. Network organizations cannot exist without the willingness of staff to cooperate voluntarily, appropriate incentives, trust and knowledge. It is knowledge that creates the context necessary for the transition to new innovative organizational and management forms.

The market is often understood as a purely capitalist phenomenon based on commodity-money relations. In fact, it is simply a network for the exchange of goods and services. The need for such a comprehensive network arose with the separation of the roles of consumer and producer created by industrial civiliza-

tion. The convergence of these roles entails a significant transformation of the market model. The market has made everyone and everything interdependent. Due to this, the belief that economic interests play a key role in human life has spread. The market has taught us to consider life as a succession of contracts and transactions. Thus, the expansion of the market has shaped the values of industrial civilization. The global market has been built; it has nowhere else to expand. The distribution system has also reached its limit of development. The creation of *the global market* was the greatest achievement of industrial civilization.

While the second-wave civilization stressed the need to study different things separately, the third-wave civilization draws attention to their interrelationships, context and integrity, which does not correspond to the mentality of Western man, but fully corresponds to the mentality of Eastern man. The third-wave civilization pays attention to their interrelationship, context and integrity, which does not correspond to the mentality of Western man, but fully corresponds to the mentality of Eastern man, who perceives the world in its unity and diversity. According to *the mechanistic approach* of the second wave, any event can, in principle, be predicted. The third-wave systems thinking, based on the analysis of an infinite number of combinations of positive and negative feedback loops, draws a line between phenomena that can and cannot be predicted. Nobel Prize winner Ilya Prigogine proposed a remarkable synthesis of chaos and order with chance and necessity, explaining how they influence causal relations (Prigogine and Stengers 1986).

Industrial civilization leaves the world in a state of the widest *gap between rich and poor*. According to the second wave, the solution to this problem is to help poor countries catch up with rich countries by building an industrial economy there. The analysis of the peculiarities of the third-wave civilization constantly reveals its similarity to the first-wave civilization, but on a fundamentally different technological level. We believe that it is quite reasonable to ask the question: can the countries of the first wave adopt some characteristics of the third wave without the radical change of their culture and way of life that industrialization required? The integration of the most advanced technologies of the third wave into the way of life of a patriarchal agrarian society may lead to the emergence of a completely new type of society. The third wave is not only a technological revolution. It brings revolutionary changes in all spheres of life, in all dimensions of civilization.

The new civilization will have a much more diversified energy base, dominated by environmentally friendly renewable sources. The technological base of the third wave will also be widely diversified: from biology, genetics, electronics, materials science to exploration of space and ocean depths. Due to the unprecedented growth in the importance of information, humanity will restructure education, reorganize research work and, most importantly, the communi-

cations system. The organization of society will resemble a network rather than the hierarchy of institutions as it was before. Developing countries will give up attempts to copy the industrialized countries and will develop their own radically new development strategies based on their cultural and religious traditions, as is already happening in the BRICS. Instead of ranking people by what they possess, as the industrial wave ethic dictates, the new wave ethic will value people for what they are good at.

In order to create a third-wave social order, it is necessary to abandon the frightening, albeit incorrect, assumption that increasing diversity in society automatically leads to increased tension and conflict. What is needed is the proper delegation of decisions to the level where they can be made optimally. Changing information flows make it possible to transfer decision-making to the grassroots level. At the same time, new supranational institutions are needed to address issues more effectively beyond the competence of national authorities. *We are moving towards a world that will be more similar to a human brain with a huge number of neurons and complex connections between them than to the departments of a bureaucratic machine.* The main contradiction of our time is the confrontation between the defenders of the outdated industrial civilization represented by the West and the supporters of the information society that is replacing it, embodied by the countries of the East.

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