PROCESSES IN THE GLOBAL CONTEXT

RE-EXAMINING THE CONCEPT OF SECULAR TRANSFORMATION. HOW CAN WE CAPTURE THE TURN OF AN ERA? THEORETICAL APPROACHES, METHODS AND IMPLICATIONS

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This contribution explores the theoretical approaches and methods of my book 'Zeitenwende. Corona, Big Data und die kybernetische Zukunft' ('Turn of an Era. Corona, Big Data, and The Cybernetic Future'), published in German language at Promedia in 2022.

The following considerations have benefited from the many reviews, discussions and interviews, I have had with colleagues, media, podcast and video platforms, and at book presentations all over Germany, Austria and Switzerland. Apart from approval, I have received a list of open questions which encouraged me to re-examine my approach and verify my arguments.

Turn of an Era addresses the transition from the industrial to the cybernetic principle as a major turning point in the history of mankind. With regard to the scheme of long-term historical development, Komlosy builds on Leonid Grinin, Anton Grinin and Andrey Korotayev (Grinin and Grinin 2016; Grinin, Grinin, and Korotayev 2017), to whom she is grateful for the model of triple cycles of accumulation, hegemony and the production principle. The Russian school of big history and social evolutionary research has so far not been received in German-speaking global studies. Their contributions add new insights into the field of world-system transformation.

The transition gains momentum in the face of the Corona crisis management, which is portrayed as a dynamizing element, occurring at a moment when Kondratiev cycles and shifts in global hegemony coincide with a secular conjunction, the rise of the cybernetic mode of production. Hence, Corona management is analyzed as an accelerating factor in the promotion of new lead sectors and novel ways of structuring production flows, needs and wants as well as political governance.

In the course of reflecting the theoretical and methodological approaches, outlining the structure and theoretical concepts, special interest is devoted to answering the question of how to identify an epochal turning point at a moment when we cannot yet foresee outcomes and future developments. For a historian, it is not enough to rely on foresight models alone. In addition, Corona and its

Recommended citation: Komlosy, A. Re-examining the Concept of Secular Transformation. How Can We Capture the Turn of an Era? Theoretical Approaches, Methods and Implications. *Journal of Globalization Studies*, Vol. 15 No. 2, November 2024, pp. 65–80. DOI: 10.30884/jogs/2024.02.04.

handling during the special period 2020–2022 offered a unique moment for empirical research, creating a global laboratory from which no one could escape. A state of emergency, with regard to movement, communication, consumption sectoral dynamics, the vulnerability of supply chains … providing abundant sources and evidence to study the transition from industrial to cybernetic capitalism in a nutshell. Corona's disruptive effects first met health. Given the concern about life and death, health and health-related industries developed into the motion center for social change that affected society far beyond health, across all sectors and spheres of life.

***Keywords**: Artificial intelligence, Capitalism, Commodity Chains, Concepts of work, value and value appropriation, Corona pandemic management, Crises, Cybernetic principle, Data provision and utilization, Digitalization, Health and body surveillance, Hegemonic shifts, Industrial principle, Kondratiev cycles, Leading sectors, Secular transformation, World system reconfiguration*

The Praise of Disruption

Praise of the 'disruption', triggered by the outbreak of Sars-Cov-2, became widely spread across different political and theoretical milieus in recent years. The evidence ranges from universities and think tanks, to governments and NGOs, to those business representatives whose turnover and profits rocketed with the Corona-lockdowns and contact restrictions, in the first place in medical, pharma, biotechnology, information and communication technology and control industries.

The analysis of the disruptionist perspective is done by reviewing the announcements and foresight publications by organic intellectuals integrated into high-ranking stakeholder communities of the global economy. Take the example of Klaus Schwab, Director of the World Economic Forum:

> Nothing will ever return to the 'broken' sense of normalcy that prevailed prior to the crisis because the coronavirus pandemic marks a fundamental inflection point in our global trajectory. Some analysts call it a major bifurcation, others refer to a deep crisis of 'biblical' proportions, but the essence remains the same: the world as we knew it in the early months of 2020 is no more, dissolved in the context of the pandemic. Radical changes of such consequence are coming that some pundits have referred to a 'before coronavirus' (BC) and 'after coronavirus' (AC) era (Schwab and Malleret 2020: 8).

The majority of commentators could not hold off applauding the catalytic effect, resulting from the close collaboration between governments, central banks, international organizations and the private sector in creating an exceptional window of opportunity for medical, ITC and control companies. It started when governments all over the world created a state of emergency by decreeing distance laws, subjecting residents to mandatory medical tests and treatments, tracking apps and movement controls, linking access to public and private spaces to negative test results or providing proof of Sars-Cov-2-vaccinations.

The World Health Organization (WHO), in close cooperation with private health lobbies (the Global Alliance for Vaccines and Immunization GAVI, Coalition for Epidemic Preparedness Innovations CEPI, the Bill-&-Melinda-Gates Foundation, *etc*.),

pushed states to approve vaccines, albeit only on a provisional basis. And governments and central banks mobilized financial support by ordering protective and medical products, covering costs, compensating businesses for losses due to the lockdown, and financing new restructuring. Rudolf Hilferding could jump in his grave for receiving evidence for his theory of 'organized capitalism' (1910), which he had developed to describe the close alliance between state, big finance and big business at the wake and during World War I.

Covid-19 came as a serious, unknown infectious disease that was blown up into a global threat to humankind against better medical knowledge. Instead, a standard version of interpretation and policy recommendation claimed to be the only truth, while critical experts were silenced. Instead of strengthening public health, social resilience and the body's own defenses, protecting vulnerable groups and providing workable advice on individual medical treatment, quarantine, isolation and vaccination were propagated around the world, with only minor differences between national programs, and with more vigor and enthusiasm in high-income than in low-income strata as well as states. However, neither the book *Turn of an Era* nor this article argues on medical grounds.

Covid-19 was turned into an enemy to be fought in a war-like manner, 'whatever it takes', in terms of public spending and the violation of civil rights and democratic procedures. The sense of shock and uncertainty that gripped every citizen, who had to abandon private and professional contacts, mirrored the disruption that turned the economy upside down. According to WEF director Klaus Schwab and many participants and followers of this high-rank event, this disruption was seen as an overdue remedy for the necessary transition to the 'fourth industrial revolution', as Schwab calls the transition from the industrial to the cybernetic mode (Schwab 2016). The disruption of the way we live, work, produce and communicate by digital optimization represents a turning point in history, transcending industrial capitalism, as well as the social relations and the political order it created, towards a new production regime.

Similar to Schwab, the social scientist Jeremy Rifkin pins his hopes on the 'great disruption'. It will pave the way for a 'digital neuronal network across the entire global economy' that controls, coordinates and monitors all 'flows and activities via Big Data and sensors in every device,' connecting people, machines and devices and thus creating the conditions for productivity growth and increased efficiency (Rifkin 2019: 34; Translation from German).

Charismatic authors like Schwab, Rifkin and others provide the appropriate message control, how to assess transformation and how to frame it. On the one hand, the transition is presented in such a way that there is no alternative. On the other hand, they are convinced that Corona and its management have given a strong impetus to its implementation, overcoming the hesitation and skepticism of governments, companies, workers and consumers, when it comes to accepting the new venture. Once established as the new normal, they say, it will save humanity from a dead end, not only in terms of the pandemic, but with regard to overcoming outdated industrial sectors and outdated labor and consumer regimes with new lead industries, products, needs and behaviors. Health, body optimization and environmental protection will lead humanity into a new era of growth and prosperity, of general well-being for those who join it, if they follow the

rules of the 'Great Reset' (Schwab) or the 'Green New Deal' (Rifkin), included into the agendas of the OECD, the G7, the G20 and others, and are adapted from there at member state level.

Some of the formulas have a progressive, attracting flavor, linked to the idea of networking, sharing, self-learning and improvement through feedbacks, developing the efficiency of products and management, overcoming the hierarchies and institutional constraints of the factory, the bureaucracy and the nation-state. They promise to overcome the multiple crises of late industrial society and the deficiencies of the democratic political system. Conversely, the program deliberately omits the limits and the problematic implications of each proposal. Sharing has become a new sector, outcompeting established rental and transport companies, by undermining labor and social regulations. The individualization of products goes hand in hand with cognitive incursions into the production of needs. The replacement of share-holders by stake-holders, meaning any person, corporation or legal entity affected by a problem, bypasses parliaments and undermines democratic decision-making. The high speed of digitalization in every activity does not address the loss of jobs, income and skills, once replaced by robots and AI. The exploding extraction and appropriation of data lags behind appropriate legal frameworks. Once self-learning and self- adjusting machines take over more and more tasks, replacing human agency and skills, the threshold to transhumanism may be crossed, before a public debate on desired goals or unwanted consequences had started.

Recovery versus Final Stage of Capitalism

In recent decades, many critical analyses of global capitalism have followed the assumption of a final stage, late capitalism, blaming neoliberalism and financialization for accelerating decline and eventual collapse. These analyses underestimate the capacity of the capitalist system to overcome crises by recovering, developing innovations, creating new lead sectors, lead technologies, energy systems, transport and the organization of the commodity chain.

The arguments for assuming the end of capitalism derive from different theoretical strands.

- The financialization argument claims that the financial sphere, which they equate with parasitic speculation, deprives the productive sphere of its investment input, thus drying up the grounds for further accumulation. They foresee a big crash.
- The techno-feudalist argument builds up on the former, claiming that both financialization and digitalization divert capital into the hands of owners, who do not invest in real production. They redistribute profits instead of generating new investments, necessary for value realization and accumulation, relying on extra-economic power to make profits and increase their wealth. Instead of a big crash, the replacement of financial or digital monopolies moves the economic system from its capitalist mode to a non-capitalist one, which is called neo-feudal, or techno-feudal. There are no predictions about the long-term viability of this move. Evgeny Morozov critically recapitulates the debate and its proponents in an article in *New Left Review* (2022), that did not find entry into Komlosy's *Turn of an Era*. The proponents of neo-feudalism rather focus on the fact that accumulation through the exploitation of labor under competitive conditions of markets, which they consider as the 'normal' mechanism of capitalism, is going to be

replaced by non-economic forms of surplus appropriation, gained through access to unpaid labor or unpaid data. The fusion of economic and political power leads them to conceive a feudalist revival. From a historian's perspective, this label is misleading at best.

- From a world-system perspective, Immanuel Wallerstein (2013) referred to the temporal limits of historical formations. Just as historical capitalism overcame historical feudalism or other rent-appropriating forms of dispossession of surplus from the sixteenth century onwards, it has exhausted its capacities to recover from crises at the turn of the twentieth to the twenty-first century. Internal constraints, limiting the extraction of surplus and the political legitimation of the system would lead to a systemic change, marking the end of historical capitalism

Wallerstein recognized financialization as one of the indicators of systemic decline. He would not have agreed with a neo-feudalization thesis. His conception of the capitalist world-system was not limited to the exploitation of wage labor only. The exploitation of free-wage labor was recognized as a form of surplus appropriation, embedded in a whole set of unpaid, forced, subsistence or informal work and labor, unevenly prevailing in the cores or peripheries of the world-economy, according to their political and economic position within the global division of labor (Kaps and Komlosy 2022). The debate between Robert Brenner and Immanuel Wallerstein (1974–1982) anticipated these issues. At the time, Brenner advocated a narrow concept of capitalism, relying on the surplus from free wage labor, while Wallerstein opened up new perspectives on global capitalism by including different forms of labor relations, interrelated not only by unequal exchange, as Brenner and his followers alleged, but related to their position within an unequal division of production, or global commodity chains (Komlosy and Musić 2021). Moreover, the world-system approach included state regulation into the foundations of the capitalist system, while Brenner's approach did not accept political intervention as 'normal' for capital accumulation to succeed. From a Brennerian point of view, a line can be drawn from financialization and datafication, which can be seen as anomalies, or even a return to an economic system that is driven by political rather than economic power, as advocated in the recent neo-feudalism debate (Morozov 2022). It is not surprising that Brenner in his later works joined in (*Ibid*.: 122).

After the world economic crisis of the 1970s, several indicators supported the evidence of a final stage or a transition to a different operation system of capitalism. At the same time, the symptoms of decline did not prevent public and private actors from attempting to restore the system, resulting in a fifth Kondratiev wave with its A-cycle in the 1990s – a model that I share (Komlosy 2022). Whether the digital economy in its adolescent state of the 1990s (aka the Dotcom economy) represented a relief, or whether it rather was an expression of an ongoing crisis, has been debated by economic historians. The two opposing positions continue to coexist today, each providing valuable insights. One side argued that the ensuing global crisis of 2008 continued the crisis symptoms resulting from the fourth Kondratiev wave depression, that is debt and financial expansion (Kuczynski 2012, reinforced in a public discussion with the author, in 2023, Berlin). For others, including myself, 2008 marked the transition from a period of recovery to the current, ongoing depression within the fifth wave.

The Corona Boost

With the outbreak of Corona, the thesis of inevitable capitalist collapse no longer stands up to the evidence. The Corona management has provided a powerful boost to help the capitalist system recover and find new sources of growth and profitability. The new impetus comes not only from sectoral change, preparing the rise of a sixth Kondratiev wave as part of a new production regime. It goes hand in hand with the global reorganization of power, preparing a new hegemonic cycle to succeed Western, or more precisely transatlantic, US hegemony by Asian-Pacific powers.

Methodologically, it is possible to derive business, accumulation and hegemonic cycles from the historical data, showing patterns of prosperity, recession, depression and renewal (in the case of K-waves), or rise, victory, maturity and decline (in the case of hegemonic waves) within each individual cycle. This makes them structurally comparable, although specific features always differ. In periodizing their duration and rhythm, a flexible adaption to historical circumstances is preferable against a strict fixation, leaving space for variations, deviations and unexpected non-systemic influences.

Periodizing the transition from one mode of production to another is more challenging. Grinin, Grinin and Korotayev (Grinin L., Grinin A. 2016; Grinin, Grinin and Korotayev 2017) proceed in a similar way, taking the Neolithic and the Industrial Revolutions as blueprints for the Cybernetic Revolution. Each revolution follows a pattern of initial, intermediate and final phases, before the new production principle gains dominance, at least in the global cores. The time-span for a production principle to develop from its first emergence to its full implementation and dominance varies considerably, and there is no way to predict the exact patterns of a new one. The previous cyclical developments, from their initial, intermediate to their final phases, can serve as indicators for comparison and forecasting, albeit in a very rough sense. Given the small number of cases, such forecasts risk to remain vague, if not speculative. However, they can be used as a hypothetical framework for imagining future development.

As a historian, I make a different use of the particular experimental situation that Corona management offered for observation, exploring the multiple ways in which the upcoming cybernetic production regime is entering more and more realms of human life, urban development, production flows, mobility and mobility control, commodifying data, the body, nature and biopolitics in unprecedented ways. In a similar way, the French anthropologist Pierre Lévy (1995) conceives of ‘anthropological spaces’, defined as phases of possible system development, identifying distinctive traits, characteristic of each of these evolutionary periods, starting from the space of the ‘earth’ (the hunter-collector principle), the space of ‘territory’ (the agricultural principle), the space of ‘commodities’ (the industrial principle) to the space of ‘knowledge’ (the cybernetic principle). My ‘archeological’ focus is on the most recent turning point, the transition from the industrial to a new production regime. These evaluations of soft facts do not allow us to answer the question of how long it will take for the cybernetic principle to become dominant and what obstacles and resistance digital capitalism will encounter. However, I am able to add empirical flesh to the prognostic models of Grinins & Co and Lévy's structuralist forecast models by introducing elements of ambiguity about the prospects of cybernetic modernization.

Observations of the impact off the Corona management show that prefabricated patterns may not apply. They show that the Corona management had an accelerating effect on the transformation of global capitalism, consisting of simultaneous shifts in the business cycle, the hegemonic cycle and the production regime. We therefore need to be more flexible in assuming the steps in which a new production principle is unfolding. Grinin and Korotayev, taking into account my observations, came to similar conclusions regarding the accelerating effect of the Corona momentum (Grinin, Grinin, and Korotayev 2022). Based on Big History timelines, Grinin and Korotayev can thus measure the difference between their pre-Corona and post-Corona models.

The Role of Data

The cybernetic principle is understood as the data-based control of processes, relying on feedback and self-learning to improve the outcome. Data allow the application of algorithmic digital evaluation und processing, giving way to the development of Artificial Intelligence. It is precisely the inclusion of improvement and the adaption to changing needs and challenges that distinguishes the cybernetic principle from the industrial principle. The latter is based on linear regularity, conformity and homogeneity; with the digitalization of industry, the industrial principle is step by step superimposed by the digital one, while continuing to form its material basis. Hence data gain a crucial role in cybernetics and represent an indispensable input for digital capitalism. Growth and innovation rely on the availability of data. This explains why the production, collection and processing of data preoccupies private and public management.

Among the factors of production – capital, labor, land, raw materials and knowledge – data is gaining ground. Data, understood as digitizable data, should not be confounded with knowledge and skills. Like other primary materials, data are a commodity that requires extraction before being processed for further value creation. They are marketable goods. Unlike raw materials, data are extracted from human activity. Every digital operation creates data, providing the material for the respective companies to sell, buy, merchandise or incorporate them into product design and production flows.

This is where human actors come in. They do not only create data as employees, or customers of public administrations. The more digitalization penetrates every field of life, the more data are created everywhere, by every user. The term ‘user’ suggests that these persons receive something for which they will eventually have to pay. In fact, they are offering something that is included in the data they supply: knowledge, experience, behavior, information about location, activity, contacts, habits, wishes, preferences, *etc*. Hence, users should be rather seen as ‘givers’ of data. With every click, their experience is transferred to the service provider and its customers. In an interactive process, the provider – or the institution to which the data are sold – feeds back to the ‘user-giver’, sending information, publicity, instructions for improvement, advertising or whatsoever, according to the user profile that can be extracted from the digital interaction.

In her book ‘*The Age of Surveillance Capitalism’* (2018), Shoshana Zuboff denies that the exchange of data for a particular digital service can be interpreted as a fair deal between user and provider. Interpreting the user as a trading partner ignores the fact that the trading partners of providers are the companies that buy digital data for product development, innovation or advertising. The user is constrained to offer his or her data for

free, without compensation, because 'giving' data is the only practical way to enter the platforms that provide online search, shopping, information, jobs or other services. Free services are counter-financed by other services, into which customers are won over. Growth and development depend on data, so the opportunities for data access are constantly increasing, as the expanding range of services offered by every ICT company shows: From search to geolocation, navigation, streaming, gaming, language processing, virtual reality, not to speak of professional services like IT-systems, cloud service, digital banking, data and security management, *etc*. This is the only way to satisfy the ever-growing demand for data, what Zuboff calls the 'extraction imperative'.

Transformation of Work and Labor: Exploitation versus Appropriation

Giving and acquiring user data requires new ways of interpreting the role of labor in digital capitalism. Marxist analytical tools, terms and concepts were developed within the framework of industrial capitalism. They lose some of their explanatory power, when a new production principle takes over. Platform, digital or cybernetic capitalism requires a rethinking of Marxist theory, adapting it to the new setting, and, where necessary, moving beyond orthodoxy. What is the meaning of work and labor, exploitation and surplus value, the main categories of Marxist thought, in the new digital context?

First, exploitation, defined as the transfer of surplus value from a wage-earner to an employer, is still a valid category, but it is losing importance. While robotization and the use of digitalization and Artificial Intelligence increase productivity, they reduce the need for permanent workers. Hence, capital risks losing an important source of surplus value extraction, a process already foreseen by Marx and labelled 'the melting of the rate of surplus value' or 'the tendential fall of the profit-rate'. From this tendency, classical Marxists deduce the inevitable end of capitalism. If it was overcome in previous crises by redirecting investment into new productive sectors, thus stimulating new jobs, robotization and Artificial Intelligence make things look different today. If you just focus on the volume of regular, formal employment, it looks as if work – seen as the only source of surplus value – disappears. From pushing more and more workers into underpaid or unpaid conditions, thus reducing the source of surplus to be realized by an employer, one could indeed conclude that the final stage of capitalism has been reached, as assumed by some analysts.

In contrast to theoretical assumptions and foresight models, work does not disappear. Informalization and precarization, *i.e*. the shift from regular life-time employment to unstable, less or insecure jobs, oblige workers and their family members to compensate for wage income by self-employment and by increasing the amount of unpaid household and subsistence work. It is accompanied by dislocating operations to places with lower wage costs, opening a race to the bottom. In order to understand contemporary transformations of work and labor, the concepts of work, value and value appropriation must be enlarged to include informalization, precarization, self-employment, unpaid work and new forms of slavery, in their combination and relationship with free wage labor (Komlosy 2018).

Secondly, a more fundamental shift is taking place from the exploitation of labor to the appropriation of user data, necessary for the cybernetic revolution to unfold. Providing data can be interpreted as a form of unpaid labor, necessary to survive in the more

and more digitalized world. One may object that it creates neither use nor exchange value, but resembles the category of 'shadow work', coined by Ivan Illich in 1981. Although void of value, a large number of search and online activities (online banking, online shopping, online government and administrative affairs) replace remunerated workforce, hence relieving a company of the need to employ the respective staff.

By supplying data to ICT- and follow up companies, a major factor of production, data, is created and transferred to the owners. They contain unmeasured knowledge, resulting from the human experience, users are sharing with providers during their internet activities. Formally, these data serve improving quality and accuracy of services. This is only part of the truth, because it does not prevent owners from skimming off the surplus of experience, which Zuboff calls 'behavorial surplus?' (Zuboff 2018). Thus, capital can replace the diminishing surplus value of employing workers by appropriating the surplus experience of extracting data. Zuboff was blamed by Marxist colleagues for reducing her critique of digital capitalism to the appropriation of user data, considering the dispossession of human experience as the only source of the exorbitant profits of Google and other ICT-companies (Morozov 2022: 109). Her study merits appreciation for identifying and accurately describing the cycle of dispossession and reinvestment of behavioral value, while it does not aim at analyzing the use of user data in the subsequent digital production process.

Zuboff's cycle of dispossession through the appropriation of user data need to be merged with the application of data in a new cycle of digital accumulation. A combined approach will then be able to reveal the potential of how digitalization and Artificial Intelligence may be able to overcome the crisis, resulting from the decline of the industrial system.

We can draw a line from the labor value question to the neo- or techno-feudalism debate raised above. Once surplus value is reduced to paid wage labour, as orthodox Marxism suggests, alternative sources of value cannot be identified, be it unpaid work or the supply of knowledge through data extraction. Starting from the assumption of a narrow definition of value and value creation, one might indeed conclude that digital platforms, that inevitably tie users to service providers by their monopolistic power, transcend historical capitalism, borrowing either appeals from the feudal nexus of economy and politics to describe the post-capitalist condition, or apocalyptic scenarios of a final clash. World-system analyses, despite its proximity to Marxism, is more easily able to recognize new forms of adding value and fueling profits, as well as different forms of political governance, from democratic to authoritarian. This does not prevent world-systems scholars from seeing historical capitalism decline because of lacking capacities for renewal and acceptance. In spite of different arguments, they might agree with neo-feudalism-proponents on the outcome.

In contrast, my hypothesis assumes a window of opportunity for a declining capitalist system to renew its sources of surplus value transfer via the appropriation of experience, offering new markets for the branches that lead the cybernetic transformation. The Corona management 2020–2023, which was consequently incorporated into emergency legislation after the end of the pandemic, has been increasing this window of opportunity. It is one thing to refute these doubts at a theoretical level, but it is another matter to prove its acting out in the real economy.

In Search of Added Value and Profit

Traditional Marxist economists doubt that digital services can replace industry in generating the profits, necessary for investors to move on to novel investments. They doubt that data can serve as a source of added value. Accordingly, the reputed German Marxist economic historian Thomas Kuczynski argued that the digital revolution has not been able to trigger a new growth cycle since the 1970s (Kuczynski 2012; oral communication 2023). Similar to financial investment, digitalization has allowed entrepreneurs to make profits, he admits. However, profits should not be equated with value added. Instead of opening up a new field of productive investment, the platform economy rather redistributes profits from productive to non-productive fields.

A major dispute is about the definition of which economic activity can be attributed value and surplus generation. In his 'Capital I' (1867), Marx referred mainly to (large-scale) industry, which is not surprising in times of rapid spread of the factory system in more and more sectors of the economy in the nineteenth century. He did not fully apprehend the commodification of knowledge and services. This vision survived up to the way in which socialist states in the twentieth century accounted for their economic activities distinguishing between productive and non-productive sectors. Marx's theoretical framework does not allow for the recognition of the character of labor in activities that are not involved in the production of surplus value. But he is ready to accept that a teacher, for example, could do so by producing productive workforce (Marx 1953 [1867]: 532). In the third volume of 'Capital' (1894, quoted in Morozov 2022: 120), he even admits that a capitalist does not necessarily need to employ workers in his sphere of production in order to benefit from the exploitation of the surplus labor of the working class in general, as if anticipating the IT-platform economy of the twenty-first century. This may encourage us to adapt Marx's methodology in the context of the twenty-first century.

If we do so, the use of data deserves a closer scrutiny. Digital platforms serve as intermediaries between the use-value of Internet data and their subsequent commodification. As a commodity, data can generate profit margins for the company that sells them. This transaction does not suffice to create surplus value, however. Surplus value from data application and processing occurs when data are launched into the process of production. This is where the cybernetic mode differs from the industrial one: It requires data in order to develop the products and organize production in a way that is constantly mediating production processes and adapting the produces to changing needs.

We do not only need to expand our notion of work and labor by including precarious work, outsourced work, and data-giving in the click economy; we also need to enlarge our notion of what constitutes the process of production. Following a commodity chain approach, the production process ranges from raw material extraction, product and process development, design, manufacturing (in the case of hardware), programming (in the case of software), to advertising, transport, retailing, waste disposal, and finally reuse and restart of the whole process. These stages are often geographically distributed across low-income and high-income countries and regions, connected by logistics and just-in-time systems (Komlosy and Musić 2021). Click-activity – whether considered work or something else – is omnipresent at every stage, making the voluntary unpaid provision of data and the user's experience incorporated in them, an indis-

pensable input to fuel algorithms and Artificial Intelligence. From this perspective, data are not isolated from the productive context, but placed at the center-piece of self-regulating, self-improving systems. Medical-pharmaceutical, biotech, AI – in combination with cognitive, additive, nanotechnology and robotics – are the leading sectors in introducing the cybernetic principle to represent the organizational structure of cybernetic capitalism, if they succeed in mobilizing investment in their products. The products differ from the industrial ones, consisting primarily of services and devices that promise health, happiness, beauty and optimization. These features will be transferred to the other branches on which mankind relies for its survival, generalizing optimization as the driving force of cybernetic capitalism.

From this point of view, there is no reason to deny the new wave of accumulation the characteristics of capitalism: commodification, value creation, profitability, growth, expansion, not to speak of the shadow sides of labor exploitation, which will continue, and the appropriation of experience from data-collecting, which will explode. There are limits and possible contradictions to this rough forecast, which will be left for the last paragraph.

The following three examples show that digital services do not remain fiction, but are linked to manifest, tangible processes of production that do rely on work and labor, even if there is a shift from formal to informal and non-paid work. Moreover, they create products that expand the spectrum of commodification by enlarging the spectrum of needs. The Internet transforms the delivery of consumer, worker and citizen data into digital input factors for developing new products, tailoring and adapting them according to specific profiles in an endless circuit of consumer-business and business-consumer feedback. This is the 'real economy' of the twenty-first century, reflected not only in stock market prices, but in every product developed with the help of digitalized data.

E-communication

Information and communication technology (ICT) industries lead the turnover and profit charts, drawing users into an ever-increasing range of services that shape life in new ways. There seems to be no limit, no escape and the danger of addiction is dooming. Each of these services is based on hard-ware electronic devices with a wide range of raw material and component supplying industries around the world; ICT-services include soft-ware programs and solutions that rely on millions of workers, skilled and unskilled, partly employed, more often self-employed or dependent on anonymous crowd-work biddings that set off a spiral of undercutting wages or prices. The products are developed in a process that constantly integrates user signals, translating them into new products that create needs and shape demands.

The ICT-sector does not stand alone, but is closely connected with other branches that can only develop their services and products with the help of the ICT. As a result they transcend the ICT sector as such and show up in any branch statistics to an increasing extent. They also transform the information media, which move from print and (public) broadcasting to digitalized formats, adapted to individual consumers or groups, and thus fragmenting societies into opinion bubbles and clans of followers and identities. The addiction is not limited to individuals, but occurs for public and private institutions as a necessity to develop, communicate, market and ensure the profitability of their products in a digitalized world.

Digital Identification and Control

Personal identification is a sector that goes hand in hand with increasing digitalization. Users need to prove their identity to gain access to all kinds of sites, workspaces, event locations, institutions. Identity proving technologies range from fingerprints and iris scans to condensing information into QR codes that can be read by machines and used to decide between admission, exclusion and associated conditions. Identification and control are thus two sides of the same coin. The QR-codification manages personal identity and travel documents as well as their control at physical and virtual borders and entrances. Virtual entry points explode with the digitalization of ticketing, banking, payment, government, medical, legal and other services. The health system plays a pivotal role in the introduction and acceptance of digital ID. The coordination of health data promises to reduce costs for healthcare providers and to attract patients with the promises of better access and treatment.

Due to the Covid-19 lockdowns, digitalization was welcomed as a compensation for physical presence and personal interaction, and expanded into new realms. Covid-19 offered an ideal moment to introduce tracking and identification products for mass use, to monitor and testify to one's health status. Combined with legal requirements and, in many countries, public coverage of expenses, more and more people adapted to defining their identity in digital ways. Once the door was opened, other services follow, opening up a market.

But digital identities go beyond commodification. They are used by states to organize administration, to survey citizens for their well-being and to control them. The same effort to monitor citizens' data is taking place at the international level, with the WHO playing a central role in promoting and then mandating it. Once the WHO declares a public health emergency, member-states are obliged to follow the rules. Being aware of the WHO's sponsoring structure, with private companies and institutions guaranteeing its operation, it will come no surprise that the pharma, biotech and control industries are behind the WHO initiative to introduce global health and identity cards. This process does not end with the phasing out of the Covid-19 pandemic, but continues to translate the momentum into an accelerated process of ID digitalization.

Private-public interests also merge, when ICT and digital payment companies promote digital accounts and money transfers, cooperating with governments and UN organizations in the name of development and inclusion. Apart from the eventual benefits, each operation generates demand, sales and profits, which are reflected in revenue and profit graphs, co-financed by governments, donors and aid organizations, and which redirect public and private wealth into the hands of the businesses involved, enabling them to realize added value.

Health and Longevity

The promise of AI-based optimization of human health and body opens the door to services that transcend healing and medical therapy. From a medical point of view, one can speak of prophylactic cures to strengthen the body's defenses. As soon as the optimizing therapies aim at overcoming the physical, mental, cognitive and genetic conditions of humans, they open up to transhumanism. They are based on the cybernetic assumption that human beings resemble machines, and therefore offer toe-holds to improve them in a similar way, involving their mutual exchange. Any therapy is based on

the supply of data, received by fixing sensors attached inside and outside the body, which transmit signals to a program that suggests behavior and remedies for improvement. Watches that measure weight, pulse, blood pressure and count steps are already widely available. The recent 'quantify yourself' movement is pushing body monitoring into a whole program of self-improvement, combining health, aesthetic, fitness, mental, cognitive and genetic information with national health data, hospitals, doctors, insurance systems, drugs approval procedures, therapies, *etc.* (The Economist 2022). It relies on smart devices to monitor the body and programs to administer medicine or treatment. Moreover, it includes companies that produce monitoring and measuring instruments, fitness and optimization plans, set up, adapt and monitor them for each client, and supply and advise doctors, hospitals, clinics, spas and health resorts. All these activities feed a growing optimization industry that turns the ideal of health into a complete program for monitoring the body. This program can be combined with controlling measurements when circumstances require surveillance in the case of epidemic or terrorist threats; or it can be used as a pretext for declaring a state of emergency and suspending democratic procedures.

Will there be a Sufficient Market for AI-led Personalized Products?

Will a polarizing labor market enable consumers to afford the aforementioned products? There are serious doubts that the loss of jobs and stable incomes and the spread of impoverishment to the middle classes will confine demand. Although it may seem too early to announce a breakthrough in digital optimization, the following factors speak in its favor.

To begin with, adaptive optimization will move over from health and body to any environment and most industries, allowing them to adapt their products in response to data-generated precision. If we stay in the narrow realm of digitalized products, we must take into account the division of markets: Luxury versions for those who can afford them, low-budget versions for the middle class, who will compensate for personal service with cheaper self-service and tele-treatment, and subsidized versions for those who rely on poor relief. This is where the idea of a basic income to support people without access to remunerated work comes in. An unconditional basic income, which is often claimed by proponents, is out of sight. Digital surveillance is a perfect means of controlling the conditions that allow the needy to receive this or that public support, distracting them and preventing discontent and unrest.

With a growing proportion of humanity living in developing and emerging countries, not to speak of a shift in growth from the Western North to the Global South, demand will rely on growing middle classes in these parts of the world. Their needs will shape future products and lifestyles far more than the shrinking population in the old industrialized countries. Global companies will follow their customs and habits. And they will rather prosper in these emerging parts of the world, setting the standards of innovation, communication, labor and consumer culture that will put pressure on the West. It is very likely – and we already realize it during the ongoing conflicts on over Ukraine – that the transition from a Western to a multipolar world will not occur without major conflicts as the re-distribution of wealth and power comes on the international

agenda. The nexus between capitalism and democracy, so far the preserve of high-income Western countries, may fade.

Moreover, the poor and the very poor in developing countries also have a demand for digital products. They live in conditions of deficient communication, transport and financial infrastructure, compared to the Global North, but also to privileged regional cores. Digital service companies are addressing them arguing that their products can help compensate for the lack of transport, banks and tele-cables. They could serve as bridge technologies, allowing the poor to participate in modern communications by owning a mobile phone, having an account, getting credit, visiting websites or tele-doctors, *etc*. Of course, these technologies cannot bridge the income and development gap, so large numbers of people will remain marginalized. The more they will rely on virtual rather than real inclusion, facilitated by digital products. As desperate people risk migration to seek asylum or work, health cards will determine itineraries and entries, the digital passport will identify them, mobile phones will connect them to comrades and family, and payment cards will eventually allow them to transfer money back home. The poor keep digitalization going in specific sectors, maintaining the flow of data with each operation.

Dysfunctionalities and Constraints of Digital Solutions

The road to the cybernetic future is still full of road holes. And things may not turn out the way its proponents predict. Lack of investment prospects and lack of purchasing power prospects have already been mentioned. In addition, other limiting factors need to be considered, including the limited supply of new raw materials and energy to create and run digital devices and operations. The energy costs of running continuous online AI-based services exceed the demand for electricity. Other limiting factors are human beings and the technology itself.

Already today, many people disapprove the spread of digitalization, they escape into archaic, identity-based or utopian communities, or fight against technological solutionism. One chapter in Komlosy's *Turn of an Era* historicizes techno-optimism and techno-skepticism, linking utopian and dystopian literature with the latest developments in overcoming natural, mental, genetic or technical constraints. Last but not least, the technological trap lurks everywhere, showing the possible dead ends of technologist thought. Many innovations that promise improvement prove the opposite. They do not work, turn out to be dysfunctional or even harmful. Instead of offering solutions, they turn out to be the problem.

Mankind is stuck in the dilemma either to retreat and risk the problem of shrinking growth and scarcity, or to intensify technological solutions to overcome the deficiencies of technology – a never-ending cycle, in which humanity and regulatory institutions will always lag behind the technological potential, the more so since they act on their own impetus. Super-intelligence may improve the problems that Artificial Intelligence caused. But it will encounter similar limitations to its technological predecessors, unless it emancipates itself from human control. As a historian or social scientist, one should be cautious about such apocalyptic predictions and leave them to novels and the visual arts.

Outlook

An overarching issue is the assessment of secular transitions that take place at specific historical conjunctures, more precisely at the transition from the industrial to the cybernetic age. The framework of cycles supports a deterministic view, *i.e*., the inevitability of change, once the economic, geopolitical and technological developments enable, require and promote it. The specific outcome depends on how human actors shape it, contrasting a deterministic picture with scope for design. However, the inherent contradictions, limits and antagonistic social and regional interests make it impossible to predict the outcome. Moreover, the dialectical interplay of action and reaction does not only offer the option of compromise or third ways, but includes unintended consequences.

The Corona moment shows that such events can have a strong impact on secular developments, accelerating them, but also creating anti-systemic movements. However, it is highly unlikely that an episodic event will be able to redirect the historical flow into other channels. What makes the situation unique is the possibility of Artificial Intelligence overtaking human intelligence – a technological arrangement that some believe will contribute to improving the capacity for planetary solutions, while others fear a transition to a post-human age.

Book Summary

For detailed references see Komlosy, Andrea (2022): *Zeitenwende.* Corona, Big Data und die kybernetische Zukunft. Vienna 2022: Promedia.

Against the background of the triple model of cyclical shifts, Komlosy's book *Turn of an Era* explores the extent to which the emergence of Sars-Cov-2 and the accompanying measures of distancing, isolation, and tracking accelerated cyclical and hegemonic change, contributed to the successful rise of new lead sectors, closely interwoven with hegemonic and cybernetic transformations. Central areas of renewal are represented by medicine, biotechnology and nanotechnology in combination with communication and information technology, robotics and cognitive optimization as new lead lectors of a next Kondratiev wave. Corona lockdowns gave them unprecedented breakthrough, allowing anticipating the consequences when introducing the cybernetic principle into economic and social life. Through distance rules, digital ‘solutions’ captivated even those who had resisted digital tools and data-sharing so far. With every click, users have been revealing behavior, experience and the body as a field for biopolitical control, the (self-)optimization business and as a provider of data, offering the cybernetic future the necessary resources and gateways.

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