Knowledge Economy: A Theoretical Review

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Most economists have characterised Knowledge Economy as an entity independent of Capitalism. Even specialists forget Capitalism, while they characterise Knowledge Economy, despite the former being the dominant economy of the world for so long. Some scholars, really bothered about Capitalism, have taken Knowledge Economy either as a post-capitalist or post-industrial economy or as a phase of the dissolution of Capitalism. As a result, all of them have lost sight of the fundamental process underway and the far-reaching consequences thereof. Examining who coined the expression, how the concept evolved when it got lost in descriptions of features, and why a theoretical review is indispensable, this essay attempts to unveil the real, namely Techno-capitalism and transnational imperialism, behind the rhetoric of Knowledge Economy.

Keywords: Information, knowledge, post-industrial, post-capitalist, techno-capitalism, science-tech hybrid areas, Patents, Intellectual Property, techno-military imperialism.

Knowledge Economy, much discussed these days, is topical and most of us have a fairly good idea about it as an economy that transforms the contemporary world. Acquisition of knowledge, the basic economic resource, is a critical economic process today. We talk about nations leapfrogging into it by ensuring preparedness to be globally competitive in innovative research. Still, most of us are commonsensical about conceiving this economy and characterising it as transformative. Scholars have been adding to the dubiousness by using the words 'knowledge' and 'information' as well as 'economy' and 'society' interchangeably and through coining new expressions like 'information society/economy' as corollary. Only a few critical political economists and social theorists have approached Knowledge Economy in the context of Capitalism. Drawing on the meaning and implications of the term economy as a system of production, consumption, and exchange this article seeks to do a theoretical review of what the expression 'knowl-

edge economy' connotes and how it operates.

Generally, Knowledge Economy is taken for knowledge-based society. Sometimes people call it Information Society too. Many writers use the terms 'economy' and 'society' as well as 'knowledge' and 'information' interchangeably. Academics use economy to mean briefly the processes of production, consumption, and exchange, each of which involves a nexus of relations. For them, Knowledge Economy pertains to the relation between what knowledge means and how it works as an economy. In the context of economy, knowledge means explicit, standardised, and codified knowledge of demand. To understand how the economy works with knowledge it is important for us to know who produces knowledge and who consumes it. Scientists produce it; technologists turn it into processes, products, and services. Entrepreneurs use them for manufacturing new products and services of demand. Societies and institutions consume them. Avowedly committed to doing a theoretical review, let us start with the question, what is this thing called 'Knowledge Economy' and how has the concept evolved? This is best demonstrated through a bibliographical roadmap.

Bibliographical Roadmap

Looking at various indications of the precedence of knowledge over material goods in the market, Daniel Bell was the first to detect the emergence of a society distinct for features like phasing out of manufacturing, rise of information-led service-oriented economy, services, precedence of science-based industries; and the rise of a new managerial class of technical elites with a new principle of stratification (Bell, 1973). Diagnosing them as indications of the phasing out of the Industrial society he made a forecast of the onset of a post-industrial society preoccupied with data/information for describing the empirical world, and knowledge as the competency to make judgments.

Ever since writers have been naming this transformed state as knowledge society or information society, more or less interchangeably, notwithstanding the ambivalence between knowledge and information. Manuel Castells, a Spanish sociologist, famed for studies in information society, put up his thesis of information economy as city economy, represented it as informational society (Castells, 1989). He characterised the city as the hub of information technology and the process of regional urbanisation.

Andrew Feenberg interpreted Knowledge Economy as a new version of Capitalism, but it remained largely unheard of for quite some time (Feenberg, 1991). Another work of equal theoretical importance published in the same year but not

seriously discussed despite its being directly on the political economy of information technology, was authored by Michael Perelman (Perelman, 1991). Nevertheless, P.F. Drucker taking Capitalism as the point of reference named the Knowledge Society. He was the first to put up the thesis of the phasing out of Capitalism and the onset of Knowledge Society as Postcapitalist Society (Drucker, 1993). His is a narrative of the surface features of the late 20thcentury society that depended on knowledge for its operation. Nevertheless, he was responsible for making the expressions 'Knowledge Society 'and 'Knowledge Economy' popular.

Manuel Castells, by the late 1990s, recognised the post-industrial economy as the one transcending the city space, encompassing the whole world and becoming epochal. He made extensive analyses of the economy, society, and culture of the Information Age in three volumes. In the first volume, he deals with the rise of the Network Society on a global scale, highlighting the economic and social dynamics of the information age (Castells, 1996). The next volume focusing on power and identity deals with the dynamics of the global economy (Castells, 1997). In the last volume, he analyses the crises of the industrial society leading to its dissolution into the global network society and marking the end of the millennium (Castells, 1998).

Several scholars thought that digital technologies were changing the capitalist world traumatically and fundamentally. It is important to remember here that Andrew Feenberg had convincingly distinguished it as Digital Age, but to identify it as a distinct phase of Capitalism (Feenberg & Hannay eds. 1995; Misa, Brey & Feenberg eds. 2003; Feenberg & Barney eds. 2004). Scholars vainly hoped that the emerging technologies would act as a catalyst for some drastic changes in the oppressed social world. Shattering the expectation that digital technology would ensure human well-being through free market economies, it only widened the wealth gap through the proliferation of billionaires. They seldom thought about how the ability to compress and store huge data of information in small devices would cause to end global poverty. Communication revolution could only deepen social divisions and undermine democracy. No technology would be socially good or bad in itself, but who uses it for what matters with respect to consequences. Only the dominant economy puts it to the most efficient use, the consequence of which would inevitably be inequality.

Antonio Negri and Michael Hardt anticipate technology to promote social production eventually upsetting the relations of production under Capitalism and to strengthen people's democracy causing the collapse of the former (Negri & Hardt, 2000). Slavoj Zizek, a Slovenian cultural philosopher, Lacanian psycho-analyst, and Communist also thought that the rise of 'cognitive work', the contradiction between

social production and capitalist relations would become more intense than ever, rendering 'absolute democracy' plausible at the cost of Capitalism. Zizek in the theoretical perspective of critical political economy and culture had imagined the collapse of Capitalism as a result of the failure of Nation-State and rise of global solidarity and cooperation as an alternative, in the wake the COVID 19 pandemic (Zizek, 2019). Although the world did seriously feel and seek alternatives to the liberal Nation-State during the days of of the major recession of 2008 first and later during the pandemic lockdown, many States with centralised power could become more autocratic. After the pandemic the people who proved the possibility of an alternative governance and economy in the paradigm of cooperation miserably fell back to their NationStates (Castells, 2017). Castells and his colleagues made this study based on the experience of Europe, USA, Canada and Australia during the recession of 2008

Theoretical Question

In the academic sense knowledge is its explicit and implicit forms codified as amenable to communication and translation into uses, services and goods. It is not mere information or data. Information driven society is theoretically different from knowledgedriven economy. Information workers are not producing knowledge but generating, storing, processing, communicating, exchanging and consuming information or data by using digital technologies. What it demands the most is the tacit form of knowledge (skill), essential to operate digital technologies.

Arguably, Knowledge Economy has to be seen as the core of the knowledge-driven economy, the macro field of multiple enterprises of auxiliary nature. Knowledge Economy distinguishes knowledge from information. It uses knowledge as patentable intellectual property of enormous exchange value as a commodity by itself. As a potential basis for the production of other commodities it is capital too. Hence Knowledge Economy is capitalintensive and technology-intensive industrial production of marketable knowledge, presupposing precedence of innovation over discovery. It makes industry a knowledgeintensive establishment combining scientists, engineers and information workers at the work-place.

Be it Information or Knowledge, the theoretical question is, whether either of them can be identified as a distinct mode of production intelligible in terms of means, relations and forces. Scholars who conceived Information or Knowledge Society as a substitute to Industrial Economy or Capitalism do not approach the problem theoretically. Those who remained theoretical in their analysis, conceived

high technology under the forces of production and the relations thereof as the basis of social relations.

Theoretical Literature

Theoretical review of Knowledge Economy means examining it through critical political economy, the only way to understand the expression comprehensively. Some studies did undertake the exercise independent of the existing body of literature that defines and characterises the economy (Feenberg, 1991; Perelman, 2004; Suarez-Villa, 2009; 2012; & 2014). As mentioned earlier Andrew Feenberg in his theoretical study of technology had made the case for treating knowledge economy as a new version of Capitalism, way back in 1991 itself. He reiterated the same argument in his subsequent studies as well, much more clearly on the Digital Age.

Following Andrew Feenberg's characterisation of knowledge economy as a new version of Capitalism, Michael Perelman, another political economist, famed for his books - *The End of Economics*, published in 1996; *Class Warfare in the Information Age* (1998); *The Invention of Capitalism*: *The Secret History of Primitive Accumulation* (2000) and so on — had studied and published a notable work on Information, Social Relations, and the Economics of High Technology, published in 1991 as already noted. Of his studies, two — one on Intellectual Property (2004) and the other on the handcuffs of Capitalism (2011) — are the most relevant to the context. Perelman unravels how Corporates confiscate creativity of the youngsters by using a very complex techno-military system of electronic sophistication (Perelman, 2004). Perelman's book on Intellectual Property is the most pertinent to the subject matter under discussion.

Michael Perelman calls the new version of Capitalism as Corporate Capitalism. Perelman's work provides the theoretical perspective of critical political economy and shows how corporations have erected a system of Intellectual Property rights to confiscate creativity, with profound impacts on the economy, science, and culture. It strikes at the very fundamental rights of an individual and ruins the micro foundation of democracy. Perelman shows that the rising importance of Intellectual Property Rights (IPR) has led to substantial theft and infringement of intellectual property, as corporations battle with one another to increase their market power, and to be the first to come up with new products and services. This mad competition has been incessantly leading to litigations on IPR theft and infringements.

Luis Suarez-Villa, a political economist and policy theorist, was the first to

name the new version of Capitalism as Techno-capitalism (Suarez-Villa, 2009). Andrew Feenberg had given a description and interpretation of Knowledge Economy as a system of capitalintensive industrial mass production of marketable knowledge. He provides the entire features of Techno-capitalism, but without coining a name for it. Suarez-Villa acknowledges how Feenberg's description helped him characterise and interpret the latest version of Capitalism as Techno-capitalism.

Techno-capitalism

Techno-capitalism is the latest phase of Capitalism, which is dependent on the production and commoditisation of technology and science for accumulation (Suarez-Villa, 2012). Commoditisation detaches knowledge from the (user) person, and conceives it an independent economic entity in the form of Patent and IPR, collectively called the Intellectual Asset or Intangible Asset. This is a new form of commodity fetishism that holds good in the context of knowledge market. Intangible assets or intellectual assets represent both commodity and capital of unimaginably huge exchange value and investment potential respectively. This phase of Capitalism marks the transition from the factory-based tangible commodity manufacturing to the production of intangible assets.

Innovations are of vital significance in Techno-capitalism, because they generate

patents and intellectual property. Its returns amount to a lion's share of the contemporary industrial turnover. This constrains discovery science to be invention technology, for it helps the knowledge industry generate high-value commodities like IPR and Patents with enormous capital potential to diversify industries that transcend the Law of Diminishing Returns ensuring enhanced accumulation. Forming into corporate houses, Technocapitalists have evolved a new form of techno-military industrial organisation called corporation (Suarez-Villa, 2012). The new corporate establishments are deeply grounded in technological research, as opposed to commodity manufacturing and services production. Corporate techno-military imperialism uproots democracy through a variety of sophisticated ways including high wage to the select few. Systematically impairing all democratic institutions and structures, it makes the state wholly crony-capitalist. Techno-capitalism has brought production of pure science to a halt. Scientific researches that fail to generate translational knowledge amenable to commoditisation attract no funding. Production of science for the sake of science is a luxury today. Social necessity is no more the mother of invention. Corporate houses decide which sciences should be encouraged for undertaking what research projects. Science

turned technologies are their priorities. Corporates have their own experimentalist establishments for turning discovery science into invention science, and for transforming knowledge into commodities. They have globally built up a juridico-political system of electronic sophistication for confiscating the intangible assets of scientists and technologists through the purchase of Patents and IPR. Four-fifths of its total turnover is from the transaction of new knowledge both as commodity and capital.

Science-Tech Hybrid Fields

Science-tech research is the most crucial field of corporate interest today, for the discovery turned innovations fetch them enormous profit. Corporate scientists are giving birth to more science-tech hybrid domains of research. We owe most science-tech fields of recent origins to the research establishments of the Corporates. Major discoveries and inventions in the already entrenched interdisciplinary fields belong to them too. Genomics is a notable example among such fields of strikingly new discoveries. Functional Genomics with automated methods based on microarray technologies for analysing gene expressions and Structural Genomics using X-ray crystallography and robotic crystallisation procedures for determining gene structure are being given a lot of attention. Agro-Biotech enology is an area of renewed interest for them.

Other fields of great interest for Corporates are High Field NMR Spectroscopy based researches for determining protein structures, DNA barcoding for species identification, advanced Bio-engineered Molecular Processors, Synthetic Bioengineering, Bioinformatics, Biomimetics, Robotics, and Bio-pharmacology. Researches in various issues relating to layer-by-layer assembly of Nano-films, Nanotech Sensors and Transmitters etc., engaging many science-tech experts of rare competency in high powered computing.

Brain-Computer interface projects of promising innovations relevant to the imminent future are of great priority in the research institutions of the Corporates. BrainComputer Interface is a technology that lets the human brain and the external devices communicate with one another to take the respective actions intelligently. Researches in Brain Neural Controlling Interface (BCI) using Deep Learning Concepts, Neural Networks based System Specific Understanding and Brain Signal Classification using Machine Learning etc., are under way in corporate establishments.

Thousands of young scientists cum engineers of high instrumentation culture,

qualified to be great innovators of tomorrow, are working like robots in corporate research establishments at various locations around the world. These highly specialised employees drawn from all over the world work in multiple capital intensive projects of science-tech hybrid fields aiming breakthroughs in software development, robotics, engine management, graphene engineering etc., for meeting human needs projected to 2050. They facilitate hundreds of new products and US patents. Their innovation delivery system has already generated IPR and patents several billions of dollars worth.

These corporates command huge intellectual assets of amazing exchange value, amounting to as much as four-fifths of the value of most products and services in existence today ! Knowledge production being central to their industry and the potential for innovation everlasting, Techno-capitalist corporates are not disturbed by the law of diminishing returns or the phenomenon of Kondratiev Cycle (Kondratiev, Transla. Guy Daniels 1984). They do not face the threat of workers' resistance either, because the exploitation rapacious though, is well paid, unnoticed and highly sophisticated.

Afterword

Many of the works, mere rhetoric hiding the real under conceptual guises and feigned theorisations of Information Age, Post-industrial Society, Knowledge Economy, etc., obfuscate what the Knowledge Economy means and how it works. Let me wrap up the theoretical review by underscoring that Knowledge Economy is not a substitute for Capitalism as most of us presume, but the latest form of Capitalism itself. It is the latest version of Capitalism that depends on science and technology for the production of intellectual assets or intangible assets of unimaginable huge rates of exchange value and capital strength. A group of transnational elites tied to the corporate power constitute the Knowledge Economy's principal actors, who penetrate into the democratic system and reconstitute it as the government of the corporates for the corporates, and by the corporations rendered plausible by crony capitalist state-powers. This has brought forth upon the globe a new form of imperialism, namely transnational imperialism, based on the global corporate power, imbued with an array of highly sophisticated and intrusive technologies.

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