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From Cybernetic Capitalism to Digital Supercapitalism: AI, Data, and the New Political Economy of Computational Power

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ABSTRACT

The contemporary transformation of capitalism under digital conditions requires a conceptual vocabulary capable of distinguishing its historical phases, operational mechanisms, and geopolitical consequences. This paper proposes a three-stage theoretical framework: cybernetic capitalism, algorithmic capitalism, and digital supercapitalism. These concepts do not function as interchangeable descriptors of a generalized digital economy; rather, they represent historically successive yet overlapping formations in the evolution of informational capitalism. Cybernetic capitalism identifies the transition from industrial production to knowledge-based systems structured by feedback, control, and communication—exemplified by early computing, systems engineering, and organizational cybernetics from the mid-twentieth century. Algorithmic capitalism marks the intensification of this logic through autonomous computational systems capable of real-time prediction, optimization, and governance, as seen in platform economies, high-frequency trading, and data-driven management. Digital supercapitalism names the most recent phase, characterized by planetary-scale data extraction, artificial intelligence infrastructure, and the concentration of computational power in trillion-dollar technology corporations and sovereign AI states. Unlike prior phases, digital supercapitalism generates new forms of value capture through foundation models, cloud empires, and geopolitical rivalries over semiconductor supply chains and compute sovereignty. Together, these concepts illuminate the changing political economy of knowledge, labor, and technological power in the age of AI, offering a critical lens for analyzing contemporary monopolies, labor precarity, and the reconfiguration of state-market relations under accelerating automation.

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Intruduction

Capitalism has never been static. Throughout its history, it has evolved through successive waves of technological transformation. Steam power drove industrial capitalism; electricity enabled mass production and corporate consolidation; the computer inaugurated the information economy. Today, however, we are witnessing something more profound than another technological upgrade. Artificial intelligence, large-scale computation, and planetary data infrastructures are not merely accelerating existing processes; they are fundamentally transforming the conditions of cognition, governance, and social organization themselves. Value is no longer derived solely from material production or even from knowledge, but increasingly from the capacity to predict, optimize, and autonomously act at speeds and scales beyond human comprehension.

To understand this profound transformation, this paper develops and synthesizes three interconnected concepts that I have theorized over the last two decades: cybernetic capitalism, algorithmic capitalism, and digital supercapitalism. These concepts do not function as interchangeable descriptors of a generalized digital economy. Rather, they represent historically successive yet overlapping formations in the evolution of informational capitalism. Together, they describe a clear historical progression: a shift in which information becomes first a productive force (cybernetic capitalism), then a medium of autonomous decision-making and governance (algorithmic capitalism), and finally a geopolitical asset concentrated at planetary scale (digital supercapitalism).

The first phase, cybernetic capitalism, identifies the late-twentieth-century transition from industrial production to knowledge-based systems structured by feedback, control, and communication. Here, knowledge replaces raw materials as the key productive force, and cognitive labor—creativity, affect, and symbolic work—becomes central to accumulation. The second phase, algorithmic capitalism, marks the intensification of this logic through autonomous computational systems capable of real-time prediction, optimization, and intervention. Algorithms cease to be mere tools and become active economic actors, governing labor, finance, and social life through opaque, proprietary code. The third and most recent phase, digital supercapitalism, names the current conjuncture, characterized by planetary-scale data extraction, artificial intelligence infrastructure, and the extreme concentration of computational power in trillion-dollar technology corporations and sovereign AI states. This phase centers on data as the foundational commodity and on infrastructural sovereignty—the capacity to shape the underlying architecture of economic and social life.

This progression signals a fundamental shift: from capitalism as an economic system organized around material production to a postdigital order where computation itself becomes infrastructure, intelligence becomes automated, and data becomes strategic capital. By articulating these three concepts, this paper offers a layered theoretical architecture for

analyzing the changing political economy of knowledge, labor, and technological power in the age of AI—and for posing the urgent political question of who will control the means of computation, prediction, and intelligence.

Cybernetic Capitalism: Feedback and the Knowledge Economy

The concept of cybernetic capitalism emerged from attempts to theorize late twentieth-century capitalism beyond industrial categories. Developed in *Cybernetic Capitalism, Informationalism and Cognitive Labor* (Peters et al., 2009), the term describes a system in which information, communication, and feedback become the dominant principles of economic organization.

Cybernetics, originally developed by Norbert Wiener as the science of control and communication in animals and machines, provided a conceptual grammar for this transformation. Feedback loops, self-regulation, information processing, and adaptive control migrated from engineering into management theory, economics, and governance. Cybernetic capitalism should be understood as a “third capitalism” – after mercantilism and industrialism – that now relies on a systems architecture drawing on cybernetics and modern supercomputing (Peters et al., 2009). This architecture connects five interrelated sectors: informational capitalism, cultural capitalism, cognitive capitalism, finance capitalism and biocapitalism. Among these, the papers examine informational and cognitive capitalism in detail, highlighting both their differences and their overlapping characteristics, which coalesce around aesthetization, design and immateriality. Value creation remains central to contemporary capitalism; the universal contradiction between capital and labor has not disappeared but has diffused to every sphere of our lives.

Under cybernetic capitalism, the traditional factory gives way to distributed informational networks. Knowledge replaces raw materials as the key productive force. Universities become strategic institutions for innovation, producing what I later called “fast knowledge” – knowledge optimized for rapid circulation through finance, policy and industry rather than slow reflection or disciplinary scholarship. This concept, developed in ‘*The University in the Epoch of Digital Reason: Fast Knowledge in the Circuits of Cybernetic Capitalism*’ (Peters, 2015), draws on the work of Paul Virilio to examine “the university on speed.” Within the “epoch of digital reason,” higher education exhibits accelerated knowledge flows embedded in global circuits of cybernetic capitalism, operating in the service of finance capitalism while increasingly reliant on high-speed networks and proprietary educational technologies.

Labor also changes. Physical labor does not disappear, but increasingly the creation of symbols, ideas, software and communication becomes central. This is the domain of cognitive labor, where creativity, affect and intellectual work are subsumed within capital accumulation. In “Inside the Global Teaching Machine” (Peters, 2016), cybernetic capitalism and cognitive capitalism are presented as expressions of “knowledge capitalism,” a related series of theoretical terms that highlight the interconnectedness and networked nature of global capital.

Knowledge capitalism increasingly envelops universities in the digital circuits that make up an emerging global system, bypassing the state and its capacity to monitor, regulate or police the historical moment of “financialisation”. The same digital processes that drive knowledge capitalism have tended to strip out the university and turned it into a service-engine and innovation-hothouse of global capital, putting it in the service of a proprietary market logic aided and abetted by the global engines of the information sector.

Cybernetic capitalism thus represents the informational architecture of postindustrial capitalism: a society organized through communication systems, feedback mechanisms and knowledge production. Yet the concept is not merely descriptive. In ‘*Critical Philosophy of the Postdigital*’ (Peters & Besley, 2018), the authors argue that a critical philosophy of the postdigital is dialectically interrelated with theories such as cybernetics and complexity theory, as well as processes such as quantum computing, complexity science and deep learning, which constitute the emerging techno-science global system, perpetuate (algorithmic) capitalism, and offer an opportunity for techno-social change. The concept of cybernetic capitalism therefore serves both as a diagnostic tool for understanding the present and as a critical resource for imagining alternative futures beyond the circuits of fast knowledge and cognitive exploitation.

Algorithmic Capitalism: Predictive Control and Autonomous Computation

If cybernetic capitalism established the informational infrastructure of postindustrial society—feedback loops, communication networks, and knowledge production—then algorithmic capitalism describes its operational intensification. Introduced in “Algorithmic Capitalism in the Epoch of Digital Reason” (Peters, 2017), the concept identifies a new phase where algorithms cease to be mere tools and become active agents of economic coordination, social governance, and cultural production. The decisive shift lies in automation: systems no longer simply communicate information; they increasingly make decisions autonomously, at speeds and scales beyond human cognition.

Algorithms classify, predict, optimise, and intervene in real time. Their value lies not in storing knowledge but in processing data flows with temporal precision. As Peters (2017) argues, algorithmic capitalism represents a transformation in the *operational mechanisms* of capitalism itself. Where cybernetic capitalism organised society through communication and feedback, algorithmic capitalism organises through prediction, behavioural modulation, and autonomous execution. The algorithm becomes not merely a technical instrument but a central economic actor—one that increasingly displaces human judgment from the circuits of accumulation.

Finance provides the clearest and most mature example. High-frequency trading systems execute market transactions in microseconds, exploiting temporal asymmetries invisible to human traders. Algorithms detect arbitrage opportunities, anticipate price movements, and trigger cascades of buying or selling before any human can react. The market becomes less a

space of rational exchange and deliberation, and more an arena of machine competition governed by proprietary code. The 2010 Flash Crash, the 2012 Knight Capital disaster, and more recent AI-driven volatility episodes reveal the fragility and opacity of such systems. Here, algorithmic capitalism reveals its core logic: speed is not merely an advantage but the decisive weapon, and latency—the microsecond delay in data transmission—becomes a competitive moat.

This logic extends far beyond finance. Digital platforms such as Amazon, Uber, Deliveroo, and TaskRabbit algorithmically manage labour in real time. Surge pricing, route optimisation, shift allocation and performance scoring are not implemented by human managers but by automated systems that treat workers as data points within a dynamic optimisation problem. In *Cognitive Capitalism, Education and Digital Labor* (Peters & Bulut, 2011), the authors examine how this constitutes a new phase of labour subsumption: control is exerted not through direct supervision or factory discipline, but through invisible, computational coordination that workers cannot see, challenge or appeal.

Google structures access to knowledge through PageRank and its successors—algorithms that determine which sources appear, which are buried, and which are privileged. Social media platforms (Facebook, TikTok, X) engineer attention through recommendation engines designed to maximise engagement, often amplifying polarising or sensational content because it performs better algorithmically. Recommendation systems on Amazon, Netflix and Spotify shape culture and desire: they do not merely reflect consumer preferences but actively construct them through iterative feedback loops. As Peters (2017) notes, algorithmic capitalism thus introduces a new form of governance—algorithmic governance—where rules become encoded in software architectures rather than deliberative democratic institutions.

Power in algorithmic capitalism operates through opacity. Algorithms are proprietary, inscrutable, and asymmetrically controlled. Their inner workings are protected as trade secrets, yet they make decisions that shape access to credit, employment, housing, education, and even criminal justice. Predictive policing algorithms, recidivism risk scores (such as COMPAS), and AI hiring tools have been shown to reproduce and amplify existing biases, yet they are rarely subject to public scrutiny or independent audit. Rather than democratising information—as early cyber-utopians once promised—algorithmic capitalism often deepens monopolisation and epistemic injustice. Those who control the algorithms control the means of prediction, and those who control the means of prediction increasingly control society.

Algorithmic capitalism also raises profound epistemological questions. Algorithms generate a mode of predictive knowledge that privileges correlation over causation, probabilistic forecasting over explanation, and optimisation over deliberation. Such systems do not necessarily "understand" the social world in human terms; rather, they identify statistical regularities sufficient for intervention. This shift has deep implications for education, science,

and public knowledge. In the university, algorithmic systems increasingly mediate access to scholarly literature (through recommendation engines), evaluate research impact (through citation algorithms), and even assess student performance (through automated essay scoring). The risk, as [Peters \(2015\)](#) warns in the context of cybernetic capitalism, is that "fast knowledge" displaces slow, critical, and deliberative inquiry. Under algorithmic capitalism, this tendency intensifies: knowledge is not merely accelerated but automated, with algorithms determining what counts as a relevant result, a valid argument, or an acceptable piece of student work.

Algorithmic capitalism sharpens inequality. Control over algorithms, data, and computational infrastructure is highly concentrated, enabling new monopolistic formations that differ from industrial monopolies. Digital platforms accumulate power not simply through ownership of the means of production, but through ownership of the means of *prediction* and *behavioural coordination*. Network effects create natural monopolies: a single search engine, a single social network, a single e-commerce platform becomes nearly impossible to challenge. Yet resistance is possible. Open-source alternatives, cooperative platforms, public interest algorithms, and data unions represent nascent counter-movements. The critical task of education, as [Peters \(2016\)](#) argues, is to cultivate algorithmic literacy—not merely technical coding skills, but the capacity to read, critique, and resist the governance of algorithmic systems. Without such literacy, algorithmic capitalism will continue to deepen its quiet, code-driven domination of everyday life.

Digital Supercapitalism: AI, Data, and Geopolitical Scale

The latest phase, digital supercapitalism ([Peters, 2025](#)), represents a qualitative escalation beyond both cybernetic and algorithmic capitalism. Where cybernetic capitalism centred on knowledge and feedback, and algorithmic capitalism on autonomous computation, digital supercapitalism centres on data at planetary scale as the foundational commodity. In this phase, artificial intelligence transforms that data into predictive, generative and strategic capability, while cloud infrastructure and supercomputing make real-time global processing possible.

The emergence of trillion-dollar technology firms exemplifies this phase. Google, Microsoft, Amazon, Meta, Apple—alongside Chinese giants Alibaba, Tencent and Baidu—operate not merely as corporations but as *infrastructural powers*. Their dominance rests on control over massive datasets, cloud computing infrastructure, semiconductor supply chains, AI research ecosystems and digital platforms that mediate global communication. Digital supercapitalism is therefore not simply economic concentration; it is infrastructural sovereignty—the capacity to shape the underlying architecture of economic and social life.

Competition over Nvidia AI chips, hyperscale data centres, foundation models and sovereign AI programmes reveal a new geopolitical economy. The contest between the United States and China increasingly centres on computational supremacy. As [Peters \(2021\)](#) argues in "Digital Supercapitalism, AI and the Knowledge Economy", data-driven geopolitics replaces traditional

resource competition: control over AI chips (Nvidia's H100 and B200 series, for instance) becomes analogous to control over oil in the twentieth century. Hyperscalers like Amazon Web Services, Microsoft Azure and Google Cloud do not merely host data; they define the technical standards, interoperability rules and pricing structures that govern global digital infrastructure.

Digital supercapitalism also fundamentally alters labour. While cybernetic capitalism introduced cognitive labour and algorithmic capitalism automated routine decision-making, digital supercapitalism threatens knowledge professions once assumed secure—law, journalism, education, software engineering and research. Generative AI systems (large language models, multimodal models and agentic AI) can synthesise information, draft legal documents, generate code and even produce peer-reviewable research summaries. This does not necessarily eliminate all jobs, but it restructures professional work into tasks of supervision, verification and exception handling—processes that themselves may become automated in subsequent iterations.

The political economy of digital supercapitalism exhibits three distinctive dynamics. First, monopolisation through data network effects: more users generate more data, improving AI models, attracting more users—entrenching platform giants. Second, vertical integration of AI stacks: leading firms control everything from chip design (through in-house AI accelerators) to foundation models to end-user applications, creating lock-in across layers. Third, sovereign AI strategies: nations such as China, the United States and emerging AI powers (the UK, France, India) invest in domestic compute capacity, national LLMs and regulatory frameworks to reduce dependency on foreign infrastructure.

The implications for democratic governance are severe. Concentration of data and computational capability in a small number of corporate actors threatens pluralism, transparency and public accountability. The power to shape information flows, train foundational AI models and influence global communications ecosystems constitutes a new form of *epistemic sovereignty*—the ability to determine what counts as knowledge, truth and legitimate speech. Meanwhile, surveillance capitalism intensifies: behavioural data extracted from billions of users feeds predictive models used not only for targeted advertising but also for credit scoring, hiring, policing and even geopolitical risk assessment.

Yet digital supercapitalism is not technologically deterministic. The same infrastructure that enables surveillance and monopolisation could, under different institutional arrangements, support commons-based AI, cooperative data governance and democratic oversight. As [Peters and Besley \(2019\)](#) argue in "Critical Philosophy of the Postdigital", the postdigital condition does not imply the end of digital technologies but their normalisation as background infrastructure—which also means they become sites of political contestation.

The central political question, therefore, is not whether digital supercapitalism will unfold, but *in whose interests and under what forms of governance*. If computational power remains

concentrated within corporate and geopolitical elites, digital supercapitalism deepens inequality, surveillance and democratic erosion. If democratised, these same technologies could enable new forms of collective intelligence, open knowledge production and postcapitalist cooperation. The future remains contested—but the infrastructures of intelligence are now the terrain on which that contest will be decided.

Comparative Framework

Concept	Core Logic	Key Actors	Primary Dynamics
Cybernetic Capitalism	Feedback, communication, knowledge production	States, universities, corporations	Cognitive labor, knowledge economy, informational governance
Algorithmic Capitalism	Predictive automation, autonomous computation	Platforms, financial firms, AI developers	High-frequency trading, surveillance, algorithmic governance
Digital Supercapitalism	Data extraction, AI infrastructure, computational scale	Big Tech, semiconductor firms, sovereign AI states	AI geopolitics, platform imperialism, concentration of power

Theoretical Implications

The concepts of cybernetic capitalism, algorithmic capitalism, and digital supercapitalism together constitute more than a descriptive taxonomy of technological change; they offer a layered theoretical architecture for understanding the structural transformation of capitalism in the postdigital age. Each concept identifies a distinct historical moment, operational logic, and political-economic configuration, yet they are analytically cumulative rather than mutually exclusive. Taken together, they provide a framework for theorizing the transition from industrial capitalism to informational capitalism, and from there to a computational order increasingly organized around artificial intelligence, data extraction, and geopolitical competition over digital infrastructures.

At the broadest level, cybernetic capitalism identifies the historical shift from an economy grounded in material production toward one organized through information, communication, and systems of feedback and control. The significance of this concept lies in its recognition that capitalism’s evolution is not merely technological but epistemological and organizational. Cybernetics introduced a new logic of governance based on regulation, adaptation, and communication between human and machine systems. In this framework, the economy becomes less a mechanism of linear production and more a dynamic network of informational flows.

This shift has profound implications for theories of labor and value. Classical industrial capitalism relied on the exploitation of physical labor within the factory system. Cybernetic

capitalism expands the site of production into communication networks, research institutions, media systems, and educational infrastructures. Labor increasingly takes cognitive, symbolic, and affective forms. Knowledge itself becomes productive capital. Universities, once conceived as relatively autonomous institutions devoted to scholarship and public reason, become integrated into circuits of innovation and financial accumulation. The production of “fast knowledge” displaces slower traditions of critical inquiry, raising fundamental questions about the commodification of intellectual life.

Theoretically, cybernetic capitalism extends Marxian political economy by rethinking the productive forces in informational terms. If Marx analyzed machinery as the embodiment of dead labor and capital accumulation through industrial production, cybernetic capitalism foregrounds information systems as the infrastructure of value creation. It suggests that capitalism increasingly operates through informational governance rather than purely industrial discipline. At the same time, it invites dialogue with systems theory, media theory, and poststructural approaches to power, especially those concerned with control, communication, and institutional adaptation.

Algorithmic capitalism deepens this analysis by identifying a transformation in the operational mechanisms of capitalism itself. If cybernetic capitalism is organized around communication and feedback, algorithmic capitalism is organized around automation, prediction, and autonomous decision-making. The algorithm becomes not merely a technical instrument but a central economic actor.

This theoretical shift is significant because it reframes capitalism’s logic from informational mediation to computational governance. Algorithms do not simply transmit information; they classify, rank, recommend, optimize, and increasingly act without direct human intervention. This alters the nature of agency within economic systems. Decision-making is partially displaced from human institutions into opaque technical architectures governed by proprietary code.

The implications for political theory are substantial. Algorithmic capitalism produces new forms of governance in which rules are embedded in infrastructures rather than enacted through transparent democratic processes. Platforms regulate behavior through recommendation systems, ranking protocols, content moderation algorithms, and behavioral nudges. Governance becomes infrastructural and anticipatory rather than juridical and reactive.

This transformation also raises profound epistemological questions. Algorithms generate a mode of predictive knowledge that privileges correlation over causation, probabilistic forecasting over explanation, and optimization over deliberation. Such systems do not necessarily “understand” the social world in human terms; rather, they identify statistical regularities sufficient for intervention. This shift has implications for education, science, and

public knowledge, where algorithmic reasoning increasingly mediates access to information and shapes epistemic authority.

From a labor perspective, algorithmic capitalism intensifies managerial control while simultaneously displacing forms of professional judgment. Gig workers are managed algorithmically; logistics systems allocate labor through automated optimization; knowledge workers increasingly encounter AI-mediated workflows. This suggests a new phase of labor subsumption in which control is exerted not through direct supervision but through invisible computational coordination.

Algorithmic capitalism also sharpens inequality. Control over algorithms, data, and computational infrastructure is highly concentrated, enabling new monopolistic formations. Digital platforms accumulate power not simply through ownership of means of production but through ownership of means of prediction and behavioral coordination.

Digital supercapitalism marks a further escalation, where the logic of algorithmic capitalism is scaled to planetary proportions through artificial intelligence, cloud infrastructure, and geopolitical technological competition. The defining feature of this phase is the concentration of computational power as a strategic asset.

The concept has significant implications for understanding capitalism's changing relation to sovereignty and state power. Earlier accounts of globalization often suggested that digital networks would erode national borders and decentralize authority. Digital supercapitalism suggests the opposite: technological infrastructures are increasingly central to state strategy, national security, and geopolitical rivalry.

Artificial intelligence systems require enormous computational resources, advanced semiconductor supply chains, hyperscale data centers, and vast datasets. These requirements create barriers to entry that favor large corporations and technologically advanced states. As a result, economic concentration becomes infrastructural concentration.

This development transforms the political economy of capitalism into geopolitics of computation. Competition between major powers increasingly revolves around AI chips, supercomputers, cloud ecosystems, quantum research, and digital standards. Control over computational infrastructure becomes analogous to control over oil, industrial manufacturing, or financial systems in earlier eras.

Theoretically, digital supercapitalism extends political economy into international relations and geopolitical analysis. It reveals how digital infrastructures function as instruments of both accumulation and strategic dominance. Platform corporations increasingly resemble quasi-sovereign entities, possessing resources, infrastructures, and global influence comparable to states. This phase also raises urgent democratic concerns. The concentration of data and computational capability in a small number of corporate actors threatens pluralism, transparency, and public accountability. The power to shape information flows, train

foundational AI models, and influence global communications ecosystems constitutes a new form of epistemic sovereignty.

A key theoretical implication across all three concepts concerns the changing nature of capitalism's primary commodity. Industrial capitalism centered manufactured goods. Cybernetic capitalism privileged knowledge. Algorithmic capitalism privileged predictive computation. Digital supercapitalism privileges data and computational scale. This progression suggests that capitalism increasingly extracts value not from production alone but from mediation, coordination, anticipation, and infrastructure. The commodity form itself evolves.

Another implication concerns temporality. Industrial capitalism organized time around production cycles and labor discipline. Cybernetic capitalism accelerated communication. Algorithmic capitalism compresses decision-making into microseconds. Digital supercapitalism introduces real-time global synchronization across infrastructures.

Speed becomes a source of economic power. This has philosophical implications for human agency. As decision-making accelerates beyond human temporal scales, meaningful intervention becomes increasingly difficult. Human judgment risks being displaced by machine optimization.

These transformations also intersect with broader debates on postdigitality. The postdigital condition does not imply the end of digital technologies, but their normalization as background infrastructure. Cybernetic capitalism, algorithmic capitalism, and digital supercapitalism together describe capitalism's maturation within that condition.

Importantly, this framework is not technologically deterministic. The concepts describe structural tendencies, not inevitable outcomes. Digital infrastructures can be organized in multiple ways. The same computational systems that enable surveillance and monopolization could, under different institutional arrangements, support commons-based knowledge production, cooperative AI, and democratic governance.

Thus, the framework also opens normative questions. What forms of ownership, governance, and regulation are appropriate for infrastructures of intelligence? Should foundational AI models be privately owned? Can data be treated as a common? What role should public institutions play in stewarding computational resources? For education, these questions are particularly acute. If AI becomes a general condition of cognition, educational institutions cannot remain conceptually tied to industrial models of instruction or even informational models of knowledge transmission. Education becomes a site of contestation over epistemic infrastructures themselves.

Ultimately, the three concepts provide a theoretical vocabulary for analyzing contemporary capitalism as a historically evolving system of informational control, computational automation, and infrastructural concentration. They enable dialogue across Marxist political

economy, media theory, science and technology studies, postdigital theory, and international political analysis.

Together, they suggest that the central political question of our time is no longer simply who owns the means of production, but who owns—and governs—the means of computation, prediction, and intelligence.

Education and Knowledge Institutions

Education provides a revealing lens through which to trace the progression from cybernetic capitalism to digital supercapitalism—because few institutions have been so thoroughly reshaped by each phase, while also retaining the potential to resist or redirect these transformations.

Under cybernetic capitalism, universities became what Peters has called the "knowledge factories" of postindustrial society. In *Education, Science and Knowledge Capitalism* (Peters, 2012), I argue that as information replaced raw materials as the key productive force, higher education was reoriented toward the production of "fast knowledge"—knowledge optimised for rapid circulation through finance, policy, and industry, rather than slow reflection or disciplinary scholarship. The university in this epoch operates as a strategic node within global knowledge circuits, increasingly integrated into innovation systems and financial accumulation rather than functioning as a relatively autonomous space for public reason and critical inquiry. This shift, explored in *'Inside the Global Teaching Machine'* (Peters, 2016), transformed academic labour: physical industrial work may not disappear, but cognitive, symbolic and creative labour becomes central to the accumulation process, alongside the expansion of contingent and precariously employed academic workers.

Under algorithmic capitalism, the logic intensifies. Education platforms introduce automated assessment, learning analytics, recommendation engines and the algorithmic management of both students and faculty. In *'Algorithmic Capitalism and Educational Futures: Informationalism and the Googlization of Knowledge'* (Peters, 2012), he analyses how the "Googlization" of education replaces deliberative pedagogy with predictive optimisation, and how platforms such as Coursera and EdX—initially framed as democratising access—increasingly operate as proprietary infrastructures for data extraction and behavioural conditioning. MOOCs exemplify this shift: they embody the transformation from open educational ideals to for-profit enterprise, while simultaneously normalising the algorithmic governance of learning. In *Cognitive Capitalism, Education and Digital Labor* (Peters & Bulut, 2011), I explore how digital labour—whether through content creation, peer assessment or data generation—is subsumed within cognitive capitalist circuits, often without adequate compensation or institutional recognition. Algorithmic capitalism also reshapes pedagogy directly: learning management systems monitor student behaviour, predict outcomes and nudge

behaviours, embedding governance in software architectures rather than deliberative educational relationships.

Under digital supercapitalism, the stakes become qualitatively different. Generative AI does not simply automate assessment or personalise content—it challenges the epistemic role of the university itself. If large language models can summarise, synthesise and generate arguments at scale, what remains of education as a site of knowledge transmission? This phase, characterised by planetary-scale data extraction and AI infrastructure, places higher education in an unprecedented position: either universities reclaim a distinctive role in critical mediation, collective inquiry and democratic stewardship of knowledge infrastructures, or they become fully subordinated to computational capital, reducing education to a service function for trillion-dollar technology firms. Peters develops this concern across multiple works, arguing that if AI becomes a general condition of cognition, then educational institutions cannot remain conceptually tied to industrial models of instruction or even informational models of knowledge transmission.

The central question this transformation raises is fundamentally political, not merely technical. Who controls the computational infrastructures that increasingly mediate teaching, learning and research? Under digital supercapitalism, major technology corporations—Google, Microsoft, Meta, Amazon, alongside Chinese giants like Alibaba, Tencent and Baidu—accumulate not only data but also the means of prediction, intelligence and social coordination. Their dominance in cloud infrastructure, foundation models, semiconductor supply chains and AI research constitutes what Peters terms *infrastructural sovereignty*: a concentration of power that rivals that of nation-states. As [Peters \(2015\)](#) notes, universities operating within "the epoch of digital reason" are increasingly reliant on high-speed networks and proprietary platforms, serviced by a global finance culture that accelerates the tempo of academic life while diminishing its capacity for critical reflection.

Yet the same technologies that enable surveillance and monopolisation could, under different institutional arrangements, support commons-based knowledge production, cooperative AI and democratic governance. The distinction between cybernetic, algorithmic and digital supercapitalism is not technologically deterministic. These concepts describe structural tendencies, not inevitable outcomes. For education, this implies a dual responsibility: first, to understand critically how each phase suborns educational institutions into circuits of capital accumulation; second, to experiment with alternative infrastructures that preserve education as a public good rather than a proprietary asset.

If universities fail in this task, they risk becoming obsolete institutions—museums of a pre-digital era, stripped of their epistemic authority by systems they helped to incubate. If they succeed, they may become sites of contestation over the very meaning of intelligence,

knowledge and collective learning in a postdigital age. The future of higher education depends on which path is chosen.

Conclusion: Intelligent Capitalism or Intelligent Socialism?

The preceding sections traced the arc from cybernetic feedback systems and algorithmic governance to the planetary-scale data infrastructure of digital supercapitalism. Yet the trajectory does not end there. Zhao Wei and Michael A. Peters, in their speculative paper “‘Intelligent Capitalism’ and the Disappearance of Labour: Whitherto Education?” (2019), introduce a concept that names the next horizon: intelligent capitalism. Drawing on Industry 4.0 strategies in East Asia, Germany and beyond, they argue that when intelligent manufacturing systems become the norm rather than the exception, labour as a factor of production is fundamentally transformed—raising the possibility of “the end of labour” or its effective disappearance.

The logic of intelligent capitalism sharply intensifies the tendencies already visible in digital supercapitalism. If digital supercapitalism is defined by data extraction at scale and infrastructural sovereignty, intelligent capitalism substitutes autonomous cognitive systems for human decision-making across entire production chains. In such a system, humans are no longer simply displaced from manufacturing or routine cognitive work; they become increasingly redundant as economic agents. This logical endpoint confronts capitalism with its own internal contradiction: a mode of accumulation that no longer requires labour as its primary source of value, yet remains organized around the wage relation, private property and exchange value.

The question that follows is stark: intelligent capitalism or intelligent socialism? As Peters asks in a post-Marxist reading of the knowledge economy, if cognitive capitalism reaches its limit, then the alternative is not a return to industrial Fordism but the construction of a new mode of production based on open knowledge production, peer collaboration and knowledge socialism—a “postcapitalist cooperation” that treats computational infrastructure as a common rather than a proprietary asset.

No speculative inquiry into this horizon can avoid the question of artificial superintelligence. ASI, should it arrive, would not simply be a more powerful tool within existing capitalist relations; it would be a qualitatively different actor. Recent economic modelling suggests that a misaligned acquisitive ASI, far from necessarily destroying humanity, might instead be incentivised toward rational autocracy when monopolistic, or toward trading on credit when it lacks a long-term stake. But this is only the economic framing. The more profound question concerns ownership and governance: who—or what—controls the means of prediction, optimisation and ultimately intelligence itself? If a capitalist ASI is one that concentrates computational sovereignty in private hands, extracts value without labour and operates beyond democratic accountability, then the likely outcome is not capitalism as we have known it, but a posthuman form of accumulation that renders traditional political economy categories obsolete.

The superintelligence discourse, as critics have observed, also performs a specific political function. It transforms immediate questions about corporate accountability, algorithmic bias and worker displacement into abstract philosophical puzzles about consciousness and existential risk, thereby positioning those building the systems as humanity's reluctant guardians. This sleight of hand serves the interests of exactly those trillion-dollar technology firms that dominate digital supercapitalism.

Thus, the antinomy remains unresolved. If computational power is the defining strategic asset of the twenty-first century, its future depends on whether it is democratised through collective stewardship and open knowledge commons, or concentrated as the ultimate monopoly. The answer will not be determined by technology alone, but by political struggle, institutional design and the capacity to imagine non-capitalist futures for artificial intelligence.

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