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ARTIFICIAL INTELLIGENCE AND THE NOOTRANSITION: BETWEEN DIGITAL CAPITAL AND PUBLIC KNOWLEDGE¹

Abstract: The article examines the transformation of the role of artificial intelligence (AI) amid the systemic crisis of the neoliberal paradigm and the transition toward a qualitatively different model of civilizational development. AI is analyzed from a dual perspective: as an instrument for strengthening market domination, concentrating data, exercising algorithmic control over labor, and managing information flows; and as a potential infrastructure of public knowledge capable of supporting the movement toward a society organized around the priority of knowledge over capital, creative labor over alienated routine, and reasonable needs over consumer expansion. The study reveals the cyclical nature of technological enthusiasm by tracing historical continuity between the “railway mania” of Victorian Britain, the speculative dot-com boom at the turn of the millennium, and the current wave of investment euphoria in the AI segment. Each cycle demonstrates how the pursuit of super-profits stimulates technological breakthrough, while simultaneously generating financial bubbles, infrastructural disproportions, and a gap between expected capitalization and real productive effects. In many respects, it is precisely this “thirst” for super-profits that leads to systemic imbalances.

The destructive effects of digital capitalism are subjected to critical analysis. The deprofessionalization of specialists, the erosion of labor subjectivity, and the transformation of personal data into a means of commercial and social control indicate the danger of substituting genuine innovation with an imitation of efficiency, accompanied by the actual degradation of the creative meanings of human activity. Narrative modeling, behavioral analytics, and the quantification of information capital reveal the methods through which public opinion can be purposefully shaped: data become a form of power, while information flows become an instrument of influence.

Overcoming the destructive orientation of digital capitalism requires a revision of the target priorities of development. As an alternative, the article substantiates the concept of an intelligence-oriented economy as a transitional state on the trajectory toward noonomy. It argues for the need to shift economic relations away from capital accumulation and profit maximization toward the reproduction of public knowledge, the expansion of intellectual potential, and the liberation of the creative capacities of the individual. In this context, knowledge acts as a jointly used resource of social progress, while its private appropriation is interpreted as a constraint on creative and productive returns.

The realization of this orientation and the nootransition itself are revealed through the strengthening of national scientific and engineering schools, the increase in the knowledge intensity of

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production, the formation of socially significant computing infrastructure, and the creation of distributed environments for collective cognition. Movement along this path is impossible without ethical norms for working with data and stable barriers against the manipulative use of intelligent technologies – barriers that ensure the autonomy of thinking, the intellectual security of society, and the preservation of the human being as a subject of goal-setting.

Keywords: artificial intelligence, nootransition, noonomy, intelligence-oriented economy, digital capital, social progress, public knowledge, knowledge intensity, information flows, scientific and engineering schools, algorithmic control, intellectual potential.

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人工智能与智慧型转型:在数字资本与社会知识之间

摘要: 本文探讨了在新自由主义范式面临系统性危机以及向本质上不同的另一种文明发展模式转型的背景下, 人工智能 (AI) 角色的转变。本文从双重视角对人工智能进行了分析: 一方面, 它作为强化市场霸权、数据集中化、用算法控制劳动以及管理信息流的工具; 另一方面, 它被视为一种潜在的社会知识基础设施, 能够推动向新型社会转型——以知识优先于资本、创造性劳动优先于枯燥的重复劳动、理性需求优先于消费扩张为核心的社会。

该研究揭示了技术热潮的周期性特征, 追溯了维多利亚时代英国的“铁路热潮”、千禧年之交的投机性“互联网泡沫”以及当今人工智能领域投资狂热浪潮之间的历史延续性。每个周期都表明, 对超额利润的追求虽然能刺激技术突破, 但同时也催生了金融泡沫、基础设施失衡, 以及预期市值与实际生产效益之间的差距。在很大程度上, 正是这种对超额利润的“渴求”导致了系统性失衡。

数字资本主义的破坏性影响正受到批判性审视。专业人员去专业化、劳动主体性的蜕变、个人数据被转化为商业和社会控制的手段, 这些现象都表明, 在活动的创造性意义实际退化的情况下, 真正的创新正面临被效率虚拟所取代的危险。叙事建模、行为分析以及信息资本量化, 揭示了有针对性地塑造公众舆论的方式: 数据转化为一种权力形式, 而信息流则成为一种影响力手段。

要克服数字资本主义的破坏性倾向, 就需要重新审视发展目标。作为一种替代方案, 以知识为导向的经济被论证为迈向智慧型经济发展道路的过渡阶段。本文论证了经济关系必须从资本积累和利润最大化转向社会知识再生产、智力潜能提升以及个人创造力解放。在此, 知识被视为社会进步的共享资源, 而对其私有化则被视为对创造力和生产效率的阻碍。

转到这一发展方向以及智慧型转型本身, 需要通过加强国家科学技术人才培养、提高生产的知识密集度、构建具有社会意义的数字基础设施以及创建广泛的协作认知环境来实现。若缺乏数据处理的伦理规范, 以及防止智能技术被滥用的坚实屏障 (这些屏障能够保障思维的自主性、社会的智能安全, 并确保人类作为目标主体的地位), 那么迈向这条道路便无从谈起。

关键词: 人工智能、智慧型转型、智慧型经济、知识导向型经济、数字资本、社会进步、社会知识、知识密集度、信息流、科技人才培养、算法控制、智力潜力。

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Introduction: Artificial Intelligence between the Crisis of Economic Society and the Nootransition

Civilization undergoes global transformation, and the nature of this transformation extends far beyond the next economic downturn or geopolitical reshuffle. The world is experiencing a systemic developmental crisis – a crisis that has ceased to be a concern for individual segments of economic life and has affected the very logic of social organization.

The level of technological power achieved by humanity, deprived of adequate mental and intellectual support, is transforming from a tool for progress into a potential threat to the very possibility of further historical development. The paradox of our time is that the unprecedented expansion of productive capacity is accompanied by deepening social inequality, the degradation of natural systems, and growing global imbalances.

A geopolitical-economic analysis of the modern era, which examines market fundamentalism in relation to international power, production, and the state [Desai, 2024], reveals that the crisis is not linked to current market fluctuations; its source is deeper – the exhaustion of a method of economic organization subordinated to financial expansion.

The neoliberal economic model dominant since the collapse of the Bretton Woods system and especially since the Reaganomics and Thatcherism era, has exhausted its progressive potential. Financialization has displaced creative activity from the center of investors' attention, replacing long-term development strategies with speculative operations in virtual assets.

Market fundamentalism elevated to a universal principle of social relations has led to commodification of all areas of human life – from education and healthcare to culture and science. However, the crisis of neoliberalism does not mean its automatic demise. On the contrary, we are witnessing a painful transformation of this model, its desire to maintain its influence by adjusting to new technological realities.

Neoliberal configuration of modern economic society, oriented toward the priority of financial performance and the interests of speculative capital, is catalyzing the manifestations of a civilizational crisis. This model of economic organization is showing signs of structural exhaustion: an economic system built on the dominance of market fetishism and financial expansion is losing the ability to generate progressive trajectories of social development. This state can be interpreted as the exhaustion of potential of economic society – a system where the doctrine of profit maximization replaces the goals of collective advancement and intellectual creation.

An alternative evolutionary vector is associated with the establishment of a fundamentally different type of socio-economic relations based on the primacy of knowledge, scientific and technological progress, and social intelligence as the dominant productive forces [Bodrunov, 2024a]. So it is here – at this bifurcation point – that we observe the contradiction between the accrued power of productive forces and the persistence of goals reduced to profit, the value of capital, and private appropriation.

Overcoming the systemic crisis presupposes both the transformation of economic institutions and the strengthening of socio-institutional foundations of social consolidation. Collec-

tive identity, shared moral guidelines, and value matrices of collective self-awareness, viewed as resources for civic resilience [Dmitriev, 2025b], become critical in the context of external and internal challenges. Nootransition is only possible with value-based change: research on the role of sociocultural factors in the movement toward noonomy [Grechko, Pleshivtseva, 2025] and the transformation of needs during the transition to (post)capitalism and further to noonomy [Stasev, Grechko, Tyulina, 2025] demonstrate that technological modernization not accompanied by a value-based elevation of needs can only aggravate consumer dependence and social disunity.

At the same time, a fundamental shift in the organization of productive forces is unfolding: knowledge is no longer an auxiliary element of the production process but is becoming a key resource determining the competitiveness of national economies and their ability to ensure their technological sovereignty. The decisive factor is no longer the possession of tangible assets per se, but the ability to generate, accumulate, and effectively mobilize intellectual potential.

Cultivation of economic entities' knowledge resources is acquiring a distinct social dimension, as the interests of innovative development participants are increasingly aligned with societal intentions to expand human potential and advance scientific progress [Solntsev, 2024]. In this regard, the strategy of intellectual potential in a knowledge-intensive economy allows for the inclusion of artificial intelligence (hereinafter referred to as AI) in the reproduction of research traditions, competencies, and organizational memory, without reducing it to an external digital service. This task requires interdisciplinary engineering training that combines business statistics, intelligent technologies, and management of production and economic systems [Dmitriev, 2025a].

In this context, nootransition signifies a long historical movement from an economic society where economic activity is subordinated to the reproduction of value and capital to a society where the production and application of knowledge serves to reasonably satisfy needs and expand human creative potential. In the theory of noonomy [Bodrunov, 2020], such a transition is associated not with a mere growth of technology, but with a transformation of production goals, the nature of labor, the structure of needs, and the methods for appropriating the deliverables of scientific and technological progress. Consequently, digitalization (and the AI technologies it encompasses) is not yet a nootransition in itself: it can be integrated into both the reproduction of capital and socially oriented development.

At the point of historical bifurcation, where economic society exhausts its creative resources and the contours of a new world order are just becoming discernible, the technology infrastructure of the future acquires particular significance. AI is far from being a mere innovation in the tide of digital transformations – it represents a potential nexus for a new configuration of social production and knowledge. The intentionality embedded in the development of intelligent technologies will determine whether they will become a tool for deepening existing contradictions or a catalyst for the transition to noonomy – a new way of organizing production and consumption built around reasonable use of knowledge for the benefit of society.

It is in this context that the question of AI's role becomes crucial. AI today finds itself at the crossroads of two development trajectories:

- The first – inertial – involves integrating intelligent technologies into the dominant paradigm of capitalist accumulation, turning them into a means of strengthening corporate control and monopolizing data in the hands of a limited circle of digital infrastructure owners.
- The second – alternative – offers opportunities for radical revision of the goals and meanings of technological progress, transforming AI into an infrastructure for collective cognition, a tool

for liberating people from routine operations and creating conditions for unlocking the creative potential of the individual.

Technological determinism is irrelevant here – computing power alone does not determine the social content of its use. The decisive factor is the strategic choice: subordinating AI to the preservation of obsolete forms of economic rationality or shaping new relationships between humans, knowledge, and production.

Technological revolution driven by the rapid acceleration of scientific and technological progress, its “acceleration of acceleration” [Bodrunov, 2016; Bodrunov, 2022a], and the emergence of intelligent production systems is laying the objective foundation for such a transformation. The development of automated and robotic systems opens the prospect of unmanned production, when human is emancipated from direct participation in physical operations and gain the opportunity to concentrate on intellectual and innovative creation [Bodrunov, 2022b].

At the same time, a transformation of the world economic order is underway: the emergence of a multipolar world order is creating the prerequisites for new forms of integration oriented not toward market fundamentalism, but toward the coordination of scientific, technological, cultural, and economic development. In this context, noointegration offers an institutional model for interaction between states, presupposing the coordination of scientific, industrial, and cultural resources within large geoeconomic spaces. Although such associations are still in their infancy, platforms like BRICS have the potential to evolve toward noointegrative formats. The goal is to build an architecture of international interaction capable of ensuring the coordinated co-development of economies and laying the institutional foundation for global nootransition [Arkhipova, 2023; Bodrunov, 2024b]. At the same time, international assessments of inclusive AI for development [UNCTAD, 2025] emphasize the importance of infrastructure, competencies, and access to data. Without these, the digital divide only perpetuates the periphery’s dependence on technology centers.

The subject of this study is not artificial intelligence as an end in itself for commercialization or an object of speculative investment, but its potential role as a contradictory productive force for the nootransition and the intellectual and creative transformation of society [Bodrunov, 2025]. Digital capital here refers to a set of private control relationships over data, algorithms, computing power, platforms, and intellectual property rights that enable the appropriation of the results of collectively created knowledge. Public knowledge refers to jointly created and institutionally protected knowledge which expands human intellectual and creative potential, supports science, education, and material production.

AI Phenomenon in the Context of Technological Enthusiasm Cycles

The 20th century ended with the triumph of market fetishism, when the algorithms of competition and financial profitability supplanted the substantive meanings of development. Financialization disconnected capital from the realities of production, turning investment flows into a tool for speculative manipulation. The history of capitalism exhibits a consistent pattern: each major technology wave generates its own expectations of accelerated wealth, fueling financial bubbles and a widespread belief in the automatic onset of progress.

The mid-19th century was marked by “railroad fever” in Great Britain, when faith in the unlimited potential of railways sparked mass investor euphoria. Capital investment grew exponentially, outpacing the economy’s actual needs. The result was a systemic crisis that collapsed the market and ruined numerous companies and investors.

A century later, at the turn of the millennium, the world was gripped by the “dot-com boom” – a mass hysteria surrounding internet companies whose market capitalizations reached astronomical levels despite the lack of profitable business models. Investments were channeled into technological fantasies devoid of economic substance. The inevitable crash of 2000-2001 wiped out trillions of dollars of virtual value.

Research on technological revolutions and financial capital [Perez, 2002; Freeman, Louçã, 2001] shows that financial frenzy can accelerate infrastructure deployment, but then reveals a gap between speculative expectations and actual production returns. This pattern can be traced not only in the history of railways and internet companies, but also in the broader dynamics of capitalist crises, where new technologies first become the object of inflated capitalization and only then are tested in real-world industrial applications.

Changes in the course of historical development were based on shifts in technological paradigms (according to S. Yu. Glazyev [Glazyev, 1993; Glazyev, 2022]). The connection between such shifts and major economic cycles goes back to N.D. Kondratieff [Kondratieff, 2002] who demonstrated the wave-like nature of long-term changes in the capitalist economy. If the emergence and spread of a new technological paradigm coincides with the upward phase of the Kondratieff cycle, then this paradigm continues to function after the wave that generated it has ended and been replaced by a new one.

In modern economic literature, it's common to speak not simply of a sequential change in the “numbers” of technological paradigms, but rather of a transition from one dominant mode of connecting science, technology, production, and institutions to another. The sixth technological paradigm is usually associated with NBIC convergence, that is, the synthesis of nano-, bio-, information, and cognitive technologies [Roco, Bainbridge, 2002]. At the same time, discussion is already emerging about the characteristics of the next – the “seventh” – technological paradigm, where AI should not be understood as an isolated digital technology. Its significance is revealed as part of a more complex shift – the growth of knowledge-intensive production, the development of intelligent production systems, the growing role of cognitive technologies, and the transition to a type of industrial development that S.D. Bodrunov examines through the lens of NIS.2 and noonomy [Bodrunov, 2018; Bodrunov, 2024c].

AI alone does not yet create a new paradigm, much less guarantee a nootransition; it can become the cognitive-controlling core of a new technological configuration only if it connects with a new industrial infrastructure, scientific and engineering schools, digital production systems, and socially beneficial goals. Otherwise, AI remains a tool for accelerated data monetization, platform rent, and the financial capitalization of expectations.

Each technological paradigm marks a quantum leap in society's productive capabilities, but its social impact depends on whether new technology is integrated with real production, education, and industrial policy. Therefore, reindustrialization and the emergence of a digital economy, viewed as interrelated trends in innovative development [Bodrunov, Demidenko, Plotnikov, 2018], reveal a fundamental limitation: digitalization without a new industrial framework risks serving financial and intermediary operations without strengthening the creative potential of the economy.

Today, we are seeing a resurgence of similar dynamics. Capital is flowing en masse into the AI sector, where company valuations are growing faster than the actual production effects are accumulating. According to the annual AI Index 2025 report [Maslej et al., 2025], total corporate

investment in AI in 2024 reached \$252.3 billion, private investment increased by 44.5%, and the generative AI segment attracted approximately \$33.9 billion, an 18.7% increase over 2023 figures. Market capitalization of AI unicorns often outpaces these companies' ability to generate sustainable profits or create long-term value for society. These metrics represent both technological advancement and the scale of capitalization on expectations, where future rents are often valued higher than the social value already created.

An analysis of the current wave of investment reveals the dual nature of technological enthusiasm. On the one hand, it mobilizes resources for research, infrastructure, and the implementation of inventions. On the other hand, it subordinates their focus to the most rapidly monetizable solutions, increasing science's dependence on corporate platforms. Contradictions of the economy, opening up the potential for a shift toward noonomy [Khabibullina, 2022], allow us to see AI as both a risk for another financial cycle and an opportunity to channel technological power toward socially beneficial goals.

The dynamics of investment interest demonstrate that the spread of generative models is accompanied by a technological hype effect and the formation of inflated expectations regarding the economic potential of new digital technologies [Mora-López et al., 2025]. This dynamic highlights the cyclical nature of technological enthusiasm, where the thirst for superprofits and speculative expectations act as powerful catalysts for innovation but simultaneously lay the foundation for future systemic imbalances. History teaches us that every period of euphoria is inevitably followed by a sobering phase, when the gap between inflated expectations and modest actual achievements is revealed.

Destructive Logic of Digital Capitalism and the Risks of Algorithmization

Neoliberal economic model has absolutized individual rationality, reducing it to a state of mechanical automatism. Today, this rationality is personified by algorithms – “dispassionate” digital arbiters who optimize profitability, minimize costs, and maximize returns. The market has lost its historical function as a coordinator of human effort and is increasingly becoming an environment for the speculative management of attention, data, and behavioral patterns.

Major digital corporations accumulate user data, cloud resources, software platforms, and consumer access channels. The strategies for producing and appropriating AI by major companies disclose the mechanism of digital capital [Rikap, 2024]: collectively created knowledge is captured by corporate ecosystems and then returned to society in the form of paid services, dependent interfaces, and private technological standards.

The concentration of computing infrastructure exacerbates this contradiction. Today's advanced models require specialized processors, data centers, energy capacity, network services, and cloud access. An analysis of competition in AI infrastructure [OECD, 2025] shows that barriers to entry are rising both in software and at the physical level of digital production. Consequently, control over AI is increasingly determined not by the talent of researchers or the quality of algorithms, but by the ownership of computing power.

The economic value of “data” is not reducible to traditional assets: reusing the same dataset does not diminish its usefulness. The theory of data inexhaustibility and its social return [Jones, Tonetti, 2020] helps explain why the private enclosure of data conflicts with the potential broad social benefits of its use. The more data becomes a proprietary asset, the more it hinders the development of science, education, medicine, industrial management, and public planning.

The warning about the harms of AI [Acemoglu, 2021] can be interpreted as a reference to social harm that arises not from the algorithms themselves, but from commercial incentives, market power, the focus of automation, and the ways in which the resulting benefits are distributed. Therefore, questions about AI have a political economy content: who owns the infrastructure? Who sets the goals for its use? And who benefits from the enhanced productivity?

Under these conditions, labor is rapidly losing its meaningfulness where AI is being implemented as a means of externally dictating actions. An erosion of worker agency is observed – the individual is transformed from a creator into an appendage of the process, into an executor of digital commands, whose actions and professional judgment are replaced by following algorithmic signals. Research on the use of algorithms in the workplace [Kellogg, Valentine, Christin, 2020] shows that digital governance is creating a new arena for struggles over control, autonomy, procedural transparency, and the right of workers to challenge machine decisions. Deprofessionalisation is affecting entire industries: competencies are eroding, professional excellence is devalued, and qualifications are being replaced by the ability to follow instructions from digital systems.

However, AI is not limited to this destructive focus. The contradiction is particularly evident in the choice between replacing humans and expanding their capabilities. The danger of the Turing Trap, described in relation to human-like AI [Brynjolfsson, 2022], is that human imitation could be used to displace human labor, whereas the most socially beneficial path involves augmenting human thought and maintaining human participation in the production process.

Current assessments of the impact of generative AI on employment also do not support the simple scenario of the total job displacement. The International Job Exposure Index [Gmyrek et al., 2025] shows, first and foremost, a shift in the composition of occupational tasks: some operations are being automated, others are becoming more complex, and a significant proportion of jobs require retraining and institutional support. Therefore, the key question is not whether labor will be displaced, but whether it will be impoverished by algorithmic prescriptions or enriched by intellectual tools.

Empirical studies of the use of generative AI in organizations also reveal another side of the process. The introduction of AI assistants can improve productivity, especially among less experienced workers, by accelerating the transfer of accumulated organizational knowledge [Brynjolfsson, Li, Raymond, 2025]. But this effect only becomes socially beneficial if productivity growth isn't used solely to intensify labor and reduce employment, but rather supports training, skill development, the reduction of routine work, and the expansion of professional autonomy.

Digital dependence is particularly alarming in education and creativity. Future professionals increasingly place excessive expectations on AI capabilities, delegating to machines tasks that require deep understanding, critical thinking, and independent questioning. Experimental data on generative AI and creativity [Doshi, Hauser, 2024] point to an ambivalent outcome: individual productivity may grow, but the diversity of the overall output decreases. A risk of standardized thinking arises when multiple users reproduce similar answers obtained from the same digital sources. Mastery of fundamental knowledge fades into the background, giving way to superficial skills in using ready-made solutions. A generation is emerging that is technologically literate but intellectually dependent – able to manipulate tools but incapable of generating original ideas.

Digital capitalism poses serious risks to social development. The illusion of continuous innovation is created while the meaning of creative activity is actually degraded. Genuine creativity is replaced by a sham of efficiency – a frenetic activity that creates the impression of progress

but fails to produce qualitative breakthroughs. Within the neoliberal paradigm, AI functions not as a tool for developing human potential, but as a means of strengthening corporate control and concentrating power over data.

Algorithmic Management of Attention and Behavior

Tech platforms are accumulating unprecedented amounts of information about the behavior, preferences, and thinking habits of billions of people. Data is being transformed into a new form of power – the power to predict, shape, and guide human decisions. Algorithms are increasingly penetrating social interactions, transforming spontaneous communications into controlled information flows. The threat of total algorithmization of social life arises, when autonomy of thought and freedom of choice become false fronts concealing a system of subtle influence on consciousness.

Applied mathematics and the development of intelligent systems allow us to uncover mechanisms hidden from the surface. Narrative modeling, user profile analysis, behavioral pattern tracking, and personalized content distribution help structure perceptions of reality, command public attention, and shape boundaries of acceptable opinion. In this case, AI acts as a means of organizing social experience, going beyond simple information processing.

Modern algorithmic systems allow us not only to record the dynamics of public perception but also to predict social response to critical events – economic crises, political decisions, and technological breakthroughs. This poses the danger of deliberately constructing public opinion, where citizens are given the illusion of free choice within pre-set behavioral scenarios. Diversity of opinions can evolve into a “orchestrated” multiplicity, where acceptable decision options are determined by algorithmic selection even before a person even realizes they are participating in the decision.

Data is transformed into a new form of power – the power to predict, model, and guide human decisions. Information flows become a means of influence comparable in power to traditional levers of political and economic control. Working with big data requires both technological competence and ethical responsibility. Society needs to develop mechanisms for intellectual defense – the ability to resist manipulative strategies and maintain the autonomy of critical thinking in the face of total digitalization.

Global Restructuring of the Intellectual Landscape: Empirical Evidence

The 21st century is revealing the fundamental contradictions of the neoliberal model. AI is both a technological phenomenon and an indicator of profound social transformation. It is testing society's capacity for self-organization, reasonable coordination of development, and the establishment of social intelligence. The issue is no longer limited to the speed of algorithm implementation; the measure of value is now the contribution of technologies to public knowledge, the productivity of the real sector, and the expansion of human creativity.

Structural shifts in scientific and technological development are supported by empirical data. According to the AI Index 2025 [Maslej et al., 2025], publication activity in the areas of AI has more than doubled over the past decade; in 2023, the OpenAlex database recorded over 242,000 publications on AI in the computer science segment, and the share of research on this topic approached 42% of the total body of work in this area. At the same time, the position of East Asia and the Pacific region has strengthened, accounting for approximately 35% of publications and

37% of citations. China generates over 23% of global publications and a comparable share of citations. This is no longer simply a quantitative shift in academic statistics, but a sign of a redistribution of centers of intellectual leadership.

The patent landscape for generative AI exhibits a similar concentration. The WIPO report [WIPO, 2024] identified 54,358 patent families in the area of generative AI in 2014–2023; of these, more than 38,000 are associated with Chinese inventors. In this context, intellectual property is becoming a means of securing technological leadership. At the same time, the accumulation of patents can limit the dissemination of knowledge unless countered by institutions of public access, open science, and international research cooperation.

The industrial structure of innovation is also changing. Generative models, intelligent production management systems, big data processing algorithms, and industrial digital platforms are rapidly growing. However, digital maturity of a national economy cannot be measured by the number of services or the speed of software introduction. Assessing digital maturity [Blagoy, Dmitriev, Alkin, 2025] allows us to distinguish real productivity gains from the statistical illusion of innovation. However, such a diagnosis only makes sense when digital transformation is viewed through its contribution to industrial resilience, technological sovereignty, and the development of human capabilities.

The expansion of computing power exacerbates the unevenness of technological development. The AI Index 2025 documents the growth of resources required to train advanced models, and a sharp increase in the cost of developing the most complex systems [Maslej et al., 2025]. Under these conditions, competitiveness is increasingly determined by access to specialized processors, data centers, cloud services, energy capacity, and skilled research teams. AI is becoming a subject of international technological competition, where scientific leadership is increasingly linked to physical computing base. Beyond the abstract “digital” lies the very material basis of the new power: energy, equipment, infrastructure, personnel, and long-term industrial policy.

Achieving socially beneficial effects is impossible without strong scientific and engineering schools that combine fundamental knowledge with the practice of technological creation. The training of this new type of engineer must develop the ability to understand the production consequences of algorithmic decisions, to see the connection between data and the real sector, and to accept responsibility for the social impact of technical choices [Dmitriev, 2025a]. The experience of countries where engineering education is integrated into long-term industrial development priorities is instructive. In this regard, China demonstrates a consistent integration of science, education, production, and technological sovereignty.

Technological revolution driven by the emergence of intelligent production systems creates physical preconditions for liberating humans from direct involvement in routine operations. The prospect of highly automated and knowledge-intensive production [Bodrunov, 2022b] allows us to link AI with the freeing up of time for education, creativity, and research work. If there is no such a shift, automation will be reduced to cost reduction; social development will not acquire a new quality. Machines can relieve humans of some repetitive tasks, but the meaning of this liberation is determined by whether the freed time will be devoted to personal development or absorbed into a new form of market dependence.

The impact of AI on labor is twofold. OECD estimates indicate that approximately 27% of employment in OECD countries is in occupations at high risk of automation, taking into account

all automation technologies, including AI [OECD, 2023]. A more recent ILO approach refines the picture for generative AI: it is primarily a matter of redistribution and complication of occupational tasks, rather than the mechanical job displacement [Gmyrek et al., 2025]. Consequently, the quality of societal response becomes decisive: retraining, development of engineering and analytical competencies, and protection of workers' professional autonomy.

Where AI is subordinated to cost reduction, labor becomes impoverished. Where it is integrated into the development of capabilities, labor acquires new intellectual content.

The totality of empirical data allows us to draw three conclusions:

- First, AI is being institutionalized as a standard tool for managing production, financial, educational, and communication processes.
- Second, the concentration of computing, patent, and scientific resources is increasing, forming a new configuration of technological competition.
- Third, the importance of intellectual competencies as a condition for the effective and safe use of algorithmic systems is growing.

The long-term impact of the current transformation will be determined by whether society can integrate AI into education, science, industry, and social coordination, or whether it will allow it to be locked into commercial platforms where knowledge is converted into rent and humans into objects of calculation.

Intelligent Economy as a Transitional Form of Public Use of AI

Transition to an intelligent economy preserves the technological foundation of modern production but changes its social purpose. Machines, algorithms, models, and computing infrastructure must gradually emerge from the narrow confines of profitability and be integrated into the expansion of social knowledge. This reflects the transition from an economic society dependent on value and capital to noonomy; in it, productive forces are given a different purpose: human development, reasonable satisfaction of needs, and liberation of creative activity [Bodrunov, 2025].

An intelligent economy emerges where knowledge ceases to be a proprietary asset and increasingly becomes a resource for shared development. It is not at all identical to noonomy; it retains ownership, markets, competition, government regulation, corporate interests, and the struggle for technological leadership. However, within this contradictory form, a different criterion of reasonableness emerges. The value of technology is determined by its contribution to knowledge-intensive production, scientific and engineering creativity, the reduction of routine workloads, and the expansion of human intellectual and creative capabilities.

In this framework, AI loses its status as an external digital service. AI technologies can become a means of distributed cognition, connecting research networks, engineering schools, universities, industrial associations, and public computing power. However, their purpose is to support complex decisions, accelerate research work, and translate intellectual results into practical development. Human thought retains axiological primacy; the algorithm acquires instrumental status.

The political economy of the problem centers on the ownership of data and models. Data has a high social return; its use by one actor preserves the possibility of subsequent use by others [Jones, Tonetti, 2020]. Digital capital seeks to transform this property into a source of private rent. Information footprints, research deliverables, and behavioral data are captured by

platforms, protected legally and technically, and then returned to society in the form of paid services. Thus, a new enclosure of knowledge emerges – this time around data, computations, and models.

An alternative trajectory envisions distributed environments for collaborative learning. They provide the production, verification, and accumulation of knowledge; the training of personnel; and the translation of scientific achievements into industrial practice. Universities, academic institutions, enterprises, and research platforms must be connected through collaborative relationships. The concept of knowledge as a common good [Hess, Ostrom, 2007] allows us to see the fundamental condition of such an organization: openness requires rules of access, accountability of participants, and protection of shared deliverables from privatization.

Open science forms the practical prerequisite for this movement. International open science standards [UNESCO, 2021] expand access to publications, data, educational resources, and research infrastructure. Without them, public knowledge remains dependent on private platforms, corporate clouds, and patent barriers. At the same time, openness requires institutional security: sensitive data, critical infrastructure, and citizens' intellectual autonomy must be subject to public accountability.

AI is valued differently in an intelligent economy than in digital capitalism. For digital capital, success is measured by capitalization, user retention, and monetization rate. Another measure is significant for the nootransition: technology's ability to increase the knowledge intensity of production, reduce routine workloads, expand access to education and healthcare, and support science and creativity. The "social destiny" of the freed-up time becomes paramount. It can be absorbed by a new intensification of labor or transformed into a space for self-actualization.

The transformation of needs has an independent significance here. When AI serves digital capital, it perfects personalized demand stimulation, accelerates the circulation of desires, cements platform dependence, and transforms human attention into a controllable resource. Research on the dynamics of needs in the movement toward post-capitalism and noonomy [Stasev, Grechko, Tyulina, 2025] allows us to set a different criterion: technology should facilitate the elevation of needs, the development of education, health, creativity, and solidarity-based forms of participation. Otherwise, AI merely refines the settings of consumer addiction.

Ethical standards for data handling must be embedded in the very design of AI. They encompass data provenance, model training, the distribution of deliverables, impact assessment, and society's right to limit manipulative practices. Quantifying information capital transforms users' attention, trust, emotional reactions, and communicative footprints into parameters of controlled behavior. Intelligent security requires a counter-movement – preserving humans as the subject of goal-setting, protecting critical thinking, and subordinating algorithms to socially recognized norms of accountability.

Thus, the intelligent economy serves as a transitional area in the struggle for the social content of AI. It still belongs to economic society, but already contains the seeds of a different historical orientation. It represents a clash of two trends: the appropriation of knowledge by digital capital and the transformation of knowledge into a resource for social progress. The outcome depends on whether data, calculations, models, and research deliverables are integrated into the reproduction of platform rents or become elements of shared knowledge. This is where the question arises as to whether AI will remain a digital extension of economic society or become a tool for the nootransition.

Conclusion

AI embodies the central contradiction of modern scientific and technological progress. It is created through the collective labor of researchers, engineers, digital infrastructure workers, and millions of users, yet the products of this labor are only appropriated by a limited number of platform owners. AI expands access to knowledge, increases productivity, and removes some routine tasks. However, with a different societal focus, it transforms data into a means of surveillance, weakens professional autonomy, and subordinates labor to algorithmic control.

The social content of AI is not predetermined. It is shaped by ownership relations, the nature of labor, the structure of education, the focus of government regulation, and forms of international cooperation. Digital capital uses intelligent technologies to extract rent, control infrastructure, commercially shape needs, and appropriate public knowledge. Nootransition entails a different vector: increasing the knowledge intensity of production, developing scientific and engineering schools, liberating humans from routine tasks, and expanding access to knowledge deliverables.

An intelligent economy could become a transitional stage in this movement. It cannot be equated with noonomy. It still retains its dependence on value, profit, and commodity coercion; at the same time, it creates a space for transformation, where new development criteria are established within existing economic relations. The public significance of knowledge, the quality of labor, the reasonableness of needs, and the accessibility of benefits of scientific and technological progress are at the center.

This requires socially beneficial computing infrastructure, open science, personal data protection, employee participation in changing work functions, and long-term industrial policy. What matters is not the speed of digital services' distribution, but their contribution to the production of socially useful knowledge and the expansion of individual intellectual and creative potential.

Nootransition requires a conscious social choice. Technical sophistication of machines creates physical prerequisites; the focus of transformation is determined by individuals, work collectives, research traditions, the state, and institutions of public oversight. AI facilitates the movement toward noonomy insofar as knowledge serves social progress, the freed-up time serves creative activity, and increased productive capacity serves the reasonable satisfaction of needs and cooperative development.

Here lies the boundary between the AI of digital capital and the AI of nootransition. In the former, intelligence is transformed into a computational resource for profit; in the latter, it becomes a source of social development. The future of AI is determined not by the power of models or the speed of computation, but by the social impact of the technology. It can be devoted to capital accumulation, platform rents, and algorithmic control. Or it can also benefit people, public knowledge, and free creative labor.

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