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Cognitive Practice in the Era of the Internet of Things: Ave, Homo Connectus!

This article offers a philosophical investigation of how the Internet of Things (IoT) reconfigures cognitive practice, reshaping the structure of knowledge, decision-making, and subjectivity in the digital environment. It demonstrates that IoT is not merely a technological infrastructure but a mechanism that embeds cognition within algorithmic and service-based systems, reducing epistemic autonomy and deepening dependence on platforms and automated protocols. The study conceptualizes Homo connectus as a new socio-technical form of subjectivity shaped by platform dependency, technical mediation of action, algorithmic production of meaning, and systemic constraints on reflective decision-making. These transformations affect education, knowledge production, and professional competence by introducing structural reliance on service ecosystems and reducing individual cognitive sovereignty. To analyze these dynamics, the article introduces the Autonomy-Enabling Ratio (AER), a novel metric for assessing the extent of cognitive autonomy within connected environments. AER captures the ratio between autonomous and externally regulated scenarios of knowledge, education, and professional practice, providing a tool to identify algorithmic overreach and the erosion of human agency. This work contributes to philosophical discourse by framing IoT as both a technical and epistemic phenomenon, critically examining its implications for human autonomy, meaning-making, and social interaction in the context of pervasive digital infrastructures.

Keywords: *Internet of Things, cognitive practice, autonomy, philosophy of IoT, service dependence, Autonomy-Enabling Ratio, Homo connectus.*

Introduction

The Internet of Things (IoT) constitutes a technological framework based on infrastructures and protocols that integrate physical objects into digital networks for data collection, processing, and exchange. Connectivity defines the core of IoT, transforming objects into functional participants within digital ecosystems. Philosophically, IoT represents an infrastructural mode of knowledge production, wherein cognitive action – the processes of generating, interpreting, and applying knowledge – displaces cognitive action beyond the bounds of the subject through algorithmically mediated environments.

The architecture of IoT emerges from automated technical systems, algorithmic behavior regulation, and service interaction protocols. The proliferation of IoT necessitates conceptual analysis of emerging cognitive and social configurations, where knowledge becomes embedded in technical infrastructures, and access to these infrastructures determines the subject's epistemological position – their structural role in knowledge creation and legitimation [Floridi 2014: 112; Zuboff 2019: 217].

The conceptual origins of IoT trace back to the 1990s, emphasizing the digital integration of physical objects via unique identifiers [Ashton 2009]. Subsequent development materialized through sensor networks and cyber-physical systems. Structurally, IoT advances three epistemological trajectories: digital unification of knowledge, formalization of normative behaviors through digital protocols, and algorithmic governance of service interactions.

This dynamic reflects the materialization of cognitive processes – the incorporation of knowledge and cognitive structures into technical infrastructures, wherein action and knowledge are realized via algorithmic systems. The concepts of *datafication* [van Dijck 2014] and *networked epistemology* [Weinberger 2011] emphasize the automation of knowledge configuration as a functional determinant.

Philosophical approaches to IoT remain fragmented, lacking comprehensive models for understanding its cognitive and epistemological implications – particularly regarding the reorganization of cognitive action, knowledge legitimation, and autonomy.

Within the *philosophy of information* [Floridi 2014], IoT is framed as a component of the infosphere that redefines conditions of existence, communication, and cognition. In *surveillance capitalism* [Zuboff 2019], IoT functions as an infrastructure for behavioral data extraction. The *philosophy of technology* [Hui 2021] examines IoT as the convergence of material and computational domains, where environments operate as algorithmic systems. Related perspectives [Amoore 2020; Kitchin & Dodge 2020] conceptualize IoT as a framework of computational normalization. Anthropological research [Dourish & Bell 2011] addresses everyday device integration but neglects cognitive transformation. Techno-ethical studies [Greengard 2015] also underrepresent epistemological considerations.

Unresolved philosophical problems include: the translation of cognitive practices into digital protocols; restructuring of subjectivity within algorithmic service environments; delegation of epistemic agency to technical systems; and redefinition of knowledge legitimation. Addressing these gaps necessitates conceptualizing IoT as a system of cognitive practices that reshapes subjectivity, education, and knowledge structures – culminating in the formation of digital episteme, knowledge produced and operationalized through technical infrastructures, forming what can be termed a digital episteme.

This article provides a philosophical framework for analyzing cognitive practices embedded within technical environments that reconfigure knowledge, learning, and interaction. It introduces the concept of *Homo connectus*, a form of subjectivity defined by the realization of cognitive activity within platform-dependent, algorithmically mediated environments.

The methodology integrates epistemological, institutional, and educational analysis of cognitive action through hermeneutic reconstruction (conceptual models derived from philosophical traditions), critical analysis (translation of cognitive processes into technical protocols), and scenario modeling (risks associated with subject transformation in digital infrastructures).

The article proceeds in five sections: (1) IoT as materialized cognitive practice; (2) philosophical dimensions of cognitive transformation; (3) cognitive and social impacts on subjectivity; (4) the concept of *Homo connectus*; (5) effects on knowledge, education, and professional domains.

The study proposes the *Autonomy-Enabling Ratio* (AER), a metric quantifying the proportion of autonomous user decisions within the totality of IoT interaction scenarios.

The research contributes a conceptual framework for analyzing how technical infrastructures restructure cognitive processes, automate actions, and redefine autonomy within digitally mediated environments. It introduces *Homo connectus* as a structurally dependent subject whose cognitive agency is constrained by service-algorithmic infrastructures.

IoT as Materialized Cognitive Practice

The *Internet of Things* exemplifies the technical materialization of cognitive processes within digital environments. The integration of objects into networks reorganizes knowledge structures, human-technical interactions, and social configurations. IoT reflects the institutionalization of cognitive practices across socio-technical and educational domains [Floridi 2014: 113; Hui 2021: 75].

Cognitive practice is defined as an institutionally, technically, and culturally embedded system for producing, structuring, legitimizing, and applying knowledge within technical, educational, regulatory, and economic frameworks. It operates across epistemological (knowledge formation), social (normative regulation of cognition), and techno-ontological (projection of cognitive models into infrastructures) levels.

The system of cognitive practice includes: technical standardization (data protocols, interfaces, device ontologies); educational and professional training (STEM programs, engineering competencies); institutional mechanisms (digitalization strategies, corporate governance); and cultural legitimization (public representations of autonomous technologies) [Miorandi et al. 2012: 1498; van Dijck 2014: 202].

Within this transformation, IoT functions as a knowledge transmission infrastructure, embedding architectures, protocols, and analytics into autonomous control systems. Cognitive action is projected through standards, algorithms, and institutional mechanisms consolidated within digital-material environments [Floridi 2014: 119; Hui 2021: 87].

The degree of IoT integration correlates with the institutional maturity of cognitive practices. Where knowledge is formalized through standards, curricula, regulations, and management systems, technological deployment accelerates. IoT penetration thus reflects the cognitive readiness of socio-technical environments for algorithmic restructuring.

Empirical studies confirm that IoT adoption aligns with stabilized knowledge structures, high R&D investment, and advanced professional education – logistics, industry, telemedicine, cybersecurity, finance, and urban management. Sectors with fragmented cognitive structures – agriculture, culture, public governance, and basic education – exhibit lower integration, illustrating the dependency of technological development on institutionalized cognition [Viasat 2024; Ubisense & Arlington Research 2023; IoT Analytics 2024, 2025; Kumar 2025].

IoT both reflects and transforms cognitive practice, consolidating knowledge structures while reconfiguring their function. Analyzing this requires philosophical engagement with the ontological, epistemological, and social implications of technical environments for cognition and subjectivity.

Philosophical Dimensions of Cognitive Transformation through IoT

IoT exemplifies the transformation of cognitive practices within technical environments that restructure knowledge, action models, and subjectivity. Initially framed as a model of networked object interaction [Ashton 2009], IoT evolved into a complex philosophical ontology encompassing infrastructures, ecosystems, and interaction ontologies [Floridi 2014].

This evolution signals reconfiguration of technical, cognitive, and social existence under IoT influence, manifesting across five dimensions:

Ontological: Environments become infrastructural systems populated by operationally active, data-generating objects. Hybrid entities – physical-digital formations – merge materiality, computation, and functionality [Floridi 2014: 72]. Objects attain quasi-subjects[1] within algorithmic environments.

Epistemological: Knowledge production shifts from human-centered processes to technical mediation. Data-driven knowledge emerges without reflec-

[1] «Quasi-subject» refers to a technical or physical-digital system that functionally affects processes, initiates actions, and participates in interactions without possessing full attributes of subjectivity (such as consciousness, ethical responsibility, or moral autonomy), yet has the capacity to modify the cognitive configuration of its environment.

tive human participation [Kitchin & Dodge 2020: 88], challenging classical epistemology and demanding new frameworks for legitimizing machine cognition.

Social: IoT restructures interaction, governance, and communication. Service architectures enhance efficiency while reinforcing control and dependency [Lupton 2016: 104]. Environmental design conditions action and knowledge access, rendering autonomy contingent upon technical mediation.

Ethical: Autonomous technical systems introduce dilemmas of data control, algorithmic decision-making, and redistributed responsibility between humans and machines [Coeckelbergh 2015: 67]. Addressing this requires an ethics of technical agency, accounting for algorithmic functions and machine boundaries.

Cognitive-practical: Everyday activity is restructured by sensor-computational environments. Technical mediation generates scenarios wherein individual action aligns with algorithmic prescriptions [Verbeek 2011: 56]. Experience and meaning-making become contingent on technical infrastructures.

IoT integrates material, digital, and cognitive domains, producing environments where automated knowledge, ambiguous responsibility, and constrained autonomy prevail. This reconfiguration demands philosophical analysis of knowledge production, subjectivity, and social structures under conditions of algorithmic mediation.

The concept of *quasi-subject* describes physical-digital systems that influence processes, initiate actions, and restructure cognitive environments without possessing full attributes of subjectivity – consciousness, ethical responsibility, or autonomy – yet significantly impact the cognitive landscape.

IoT and the Modification of Anthropogenesis within Digital-Technical Environments

The transformation of cognitive practice under the influence of IoT reshapes the parameters of subjectivity and social interaction. IoT functions as a technical environment that produces new cognitive models and interaction regimes, characterized by declining autonomy, epistemic competence, and social independence. This process generates new configurations of human subjectivity marked by the loss of self-sufficiency, functional delegation, and dependency on digital infrastructures. These conditions drive key modifications of anthropogenesis linked to the evolution of cognitive practice.

Loss of Object Autonomy and Functional Restriction. IoT transforms everyday and work-related objects from autonomous tools into network-dependent nodes under external control. Devices lose operational autonomy, becoming reliant on infrastructure connectivity, remote updates, and external management – functional authority transfers to manufacturers or service providers [Janiesch et al. 2020: 161; Manwaring & Hall 2019: 8-12].

Objects cease to be self-sufficient, as functionality becomes contingent on constant connectivity. For example, Philips Hue smart lighting systems lose most functions without network access [Signify 2023]. Opportunities for autonomous use, repair, or modification are restricted or eliminated. A new ontological dependency emerges: technical objects serve merely as interfaces to external digital resources. Users lose control over tools, retaining only fragmented functionality via subscriptions or licenses. Tesla vehicles illustrate this, where functions are activated through additional payments [Tesla 2024].

Erosion of Practical and Instrumental Knowledge. IoT displaces practical knowledge historically essential for individual survival and self-reliance. Inability to independently assess resource quality, loss of understanding of technical principles, and delegation of even basic actions to automated systems diminish human contact with the material world [Devitt 2015: 39].

Individuals lose functional competencies necessary for sustaining life in the event of infrastructural failure. Sensory criteria are replaced by digital algorithmic standards, severing ties to material reality. For instance, Hive thermostat systems render heating and security unmanageable without connectivity, even if devices remain physically operational [Yadav 2019].

Decline of Epistemic Criticality. IoT alters attitudes toward information. Data provided by devices are perceived as inherently true and objective. Basic technical functions are overshadowed by secondary, marketing-driven «smart» services that distract from essential functionality. Branding, interface logic, and visual cues replace rational quality assessment [Monteiro 2019: 170-172; Eigner 2023: 4-7].

Users lose epistemic autonomy – the ability to interpret and verify information independently. Fitbit users, for example, rely on automated health metrics while disregarding personal sensations or professional diagnosis [Fitbit 2024]. Technical quality standards are replaced by visual or marketing constructs, eroding conceptual clarity. Technological redundancy fuels an attention economy where services capture user focus through algorithmically structured interactions serving producer interests. Alexa and Google Assistant embedded in household devices exemplify this, strategically framing commercial nudges as conveniences, subtly eroding critical discernment [Cha 2023].

Delegation Prevails Over Autonomous Choice. Service-dominated IoT environments displace autonomous decision-making with algorithmic recommendations. Individuals increasingly follow pre-configured scenarios and recommended actions, bypassing reflection or critical evaluation. Services present “optimal” choices, constraining decision-making as a process of self-determination [Capasso 2022: 12-13].

Automatic execution without user confirmation diminishes awareness of participation in decision-making. Delegated choice fosters dependency on provider-defined logic. Energy management systems illustrate this, where optimal consumption patterns are provider-generated, eroding critical and value-based decision capacity [International Energy Agency 2024].

These cognitive-social transformations underpin the emergence of a new subject type – *Homo connectus* – operating within environments of external control, service dependency, and algorithmic delegation of cognitive and behavioral functions. Such developments constitute a logical phase in the evolution of cognitive practice, wherein connectivity restructures cognition into service-mediated, algorithmically regulated forms.

The Evolution of Subjectivity: From *Homo faber* to *Homo connectus*

Anthropogenesis undergoes reversal: historically, development advanced toward expanding autonomy – from physical dependence to social interaction, from social interaction to technological expansion, from technological expansion to informational self-governance. IoT-driven cognitive transformations invert this trajectory: cognitive autonomy contracts into technical connectivity, social interaction becomes service-mediated, and informational self-governance transitions to algorithmic control.

This produces social fragmentation. Survival once ensured by collective interaction and community resilience gives way to individualized existence within service shells of platforms and algorithmic structures [Castells 2010; Srnicek 2017]. Social interaction centralizes, as communication and behavior become increasingly mediated by service infrastructures. Technological shells optimize environments and construct the architecture of social interaction and everyday life.

Humans lose awareness of systemic functioning, relying on technical connectivity to sustain reality. Meaning-seeking yields to interface navigation; existence narrows to service shells wherein platform structures subordinate materiality to algorithmic standards [Zuboff 2019]. Anthropogenesis shifts: the autonomy defining Homo faber [Mumford 2010; Arendt 1998] evolves into Homo connectus, whose life becomes inseparable from service infrastructures and consumption-driven scenarios.

Homo connectus is a conceptual innovation defining a subjectivity type emerging through cognitive practice transformation within IoT environments. This model restructures subjectivity toward service dependency, cognitive autonomy delegation, and integration into automated connectivity, wherein technical architecture governs access to knowledge, resources, and social interaction.

To delineate *Homo connectus*, prior models of digital subjectivity are considered. The *cyborg subject* reflects techno-bodily hybridity, erasing boundaries between biology and technology [Haraway 1991]. The *extended mind* posits cognition extending beyond the biological brain to include tools, records, and digital systems [Clark 1998]. The *data subject* frames individuals as data carriers defined by digital traces and control systems [Zuboff, & Tsalikis 2019]. In contrast, *Homo connectus* embodies behavioral adaptability within service infrastructures, with partial delegation of cognitive autonomy to technical systems.

Homo sapiens thought, learned, and acted as an autonomous knowledge bearer; *Homo faber* mastered tools as bodily extensions; *Homo connectus* operates as a behavioral agent within digital infrastructures where autonomy is constrained, and action is impossible outside connectivity and technical mediation. Subjectivity arises through synchronization with service ecosystems, diminishing reflexive engagement with tools.

Key Characteristics of Homo connectus:

Technically Mediated Action: Individuals act via interfaces, technical modules, or applications, with choices structured by algorithmic scenarios.

Platform Dependency: Access to resources, services, communication, and knowledge requires continuous connectivity.

Delegation of Cognitive Autonomy: Meaning orientation derives from system signals and recommendations rather than personal interpretation.

Epistemic Center Shift: Truth is validated through quantitative, algorithmic evaluation systems (ratings, relevance, classification) over subjective judgment.

Network Enclosure: Experience is confined within the horizon of platforms, services, connections, and signals.

As a methodological tool for assessing subject autonomy, this study introduces the original indicator – the Autonomy-Enabling Ratio (AER). AER serves as a universal analytical construct for philosophical and practical evaluation of individual autonomy within digital environments. It is calculated as the ratio of actually accessible autonomous action scenarios to the total number of behavioral scenarios within connected infrastructures. AER captures the level of preserved cognitive autonomy, decision-making capacity, and the ability of individuals to act independently of the structural logic imposed by technical systems.

AER aligns conceptually with contemporary autonomy assessments, including relational autonomy theory [Kempt et al. 2024] and human-machine trust evaluations [Gebru et al. 2022], yet differs methodologically by focusing on the ratio between autonomous and algorithmically regulated scenarios within connected environments. Declining *AER* indicates intensifying platformization, decision delegation, and service mediation; rising *AER* reflects cognitive autonomy preservation and epistemic competence.

AER integrates conceptual autonomy-subject capacity for orientation, interpretation, and decision-making beyond technical mediation – with ontological analysis of materialized cognitive practice and empirical autonomy assessment, offering a metric for evaluating subjectivity within digital infrastructures.

The shift toward technical dependency and autonomy delegation reshapes action structures and knowledge acquisition mechanisms, necessitating analysis of cognitive environment transformation where knowledge, education, and social integration occur.

Knowledge, Education, and Professional Practice within the *Homo connectus* Environment

As Edwin Hutchins notes, «humans create their cognitive powers by creating the environments in which they exercise those powers» [Hutchins 1995: 16]. This thesis, developed within theories of distributed cognition and cognitive ecology, acquires new significance in the technical environment of *Homo connectus*. *This statement underpins the theory of cognitive ecology, emphasizing how knowledge structures and capacities are environmentally embedded and socially mediated.*

Cognitive action in connected environments is shaped by dependence on technical infrastructures, altering access to knowledge, education, and professional activity. The subject operates simultaneously as a bearer of cognition and as an integrated element of service ecosystems [Floridi 2014: 113].

Knowledge increasingly takes the form of pre-structured informational products generated without active subject participation. IoT systems, sensor modules, and algorithmic infrastructures autonomously collect, process, and transmit knowledge, limiting reflective control and critical evaluation. Platforms and protocols govern knowledge access, constraining cognitive autonomy [Monteiro 2019: 168–169; Cotter 2020: 745].

Education within *Homo connectus* environments suppresses critical thinking and independent verification. Learning processes follow algorithmic scenarios controlled by platforms in modular «school-to-cloud» systems [European Union 2024]. Corporate standards define content structure, while access to unprocessed data and cognitive procedures is restricted. The loss of fundamental practical knowledge-technical, material, or social-deepens user dependency and weakens cognitive resilience [Devitt 2015: 39].

Professional skills are developed within algorithmically mediated infrastructures. Technical knowledge and operational competencies are standardized, fragmented, and delivered via digital services, deepening dependency on infrastructure owners [IoT Analytics 2024].

Empirical studies confirm that declining knowledge and skill autonomy directly correlates with the growing technical dependence of education and professional activity. Fewer than 50% of learners can explain the operational logic of educational systems functioning as adaptive digital modules applying algorithmic assessments with undisclosed mechanisms. Participants lack access to technical foundations of cognitive processes [Shoikova et al. 2016: 31].

These dynamics reflect structural shifts in knowledge and competence. *Table 1* illustrates the contrast between autonomous and delegated scenarios in classical versus connected environments.

Table 1. Cognitive Transformation in Classical and *Homo connectus* Environments

Parameter	Classical Model	Connected Environment
Knowledge Source	Independent cognition, reflection	Pre-structured informational products, algorithms
Information Access	Direct, unrestricted	Platform-mediated, fragmented
Educational Process	Critical verification, adaptive learning	Algorithmic scenarios, platform control
Professional Practice	Competence, autonomous decision-making	Dependency on standards and digital services

AER assessments demonstrate sectoral differences in cognitive autonomy relative to technical mediation intensity. *Table 2* presents comparative AER levels across knowledge and professional domains.

Table 2. Autonomy-Enabling Ratio (% Autonomous Action) Across Sectors (2025 Estimates[1])

Domain	AER	Primary Factors Reducing AER
Basic Education	65	20–40% of teacher tasks are automatable, leaving 60–80% under human control (average ≈ 65%)
Technical Higher Education	40	1) Only 36% of instructors regularly use Gen-AI, while 60% of students already do, resulting in major delegation of learning to systems; 2) Fewer than 10% of institutions have AI policies, reflecting external platform dependency.
Office Work	50	The WEF *Future of Jobs Report* forecasts ≥50% of office tasks will be machine-executed by 2025, implying ≈50% remain under human control.
High-Tech Manufacturing	25	Up to 58% of operations are automated; in the US, production work has a 73% automation potential (excluding Gen-AI), leaving ≈27% autonomy.
Critical Infrastructure (Aviation)	10	Autopilot is active during ≈90% of a typical commercial flight; pilot control applies to only ≈10%.

[1] AER assessments presented in this study constitute a conceptual analytical model derived from data published by IoT Analytics (2024), the World Economic Forum (2025b), McKinsey & Company (2020, 2022), Lederman (2024), UNESCO (2023), the World Economic Forum (2018), the McKinsey Global Institute (2023), and the AAG (2024), as well as from generalised trends across open-access sources.

The results reveal significant disparities in cognitive autonomy retention. The lowest AER occurs in safety-critical and high-tech manufacturing domains, reflecting algorithmic dominance and constrained independent action. Education and office work maintain moderate autonomy but exhibit declining AER under platformization. Even traditionally autonomous knowledge sectors increasingly depend on technical mediation.

AER values require not only quantitative measurement but also contextual and qualitative interpretation. This includes assessing implementation settings, risk levels, and permissible thresholds of delegation to technical systems. In high-risk domains such as aviation, AER reduction may have fatal consequences. This is demonstrated by the Boeing 737 MAX crashes (2018–2019), where the MCAS algorithm intervened in control without sufficient pilot awareness or override capability [Dekker & Woods 2024: 4–6].

Conversely, deliberate AER reduction may enhance reliability and safety – e.g., in modern weapons systems where automation shortens reaction times and reduces human error [U.S. Department of Defense 2013: 15].

Combining quantitative and qualitative AER analysis enables evidence-based governance of connectivity and autonomy. As of 2024, IoT integration remains partial: approximately 26% of industrial enterprises, 20% of healthcare providers, and 15% of public administration have adopted IoT solutions. Connectivity is concentrated in high-tech sectors, selected manufacturing segments, and pilot educational settings, while large parts of the economy and social practices continue to operate on traditional autonomous models [IoT Analytics 2024; World Economic Forum 2025a].

Education and professional practice increasingly incorporate technological and governance mechanisms to safeguard cognitive autonomy. Transparency protocols, human-in-the-loop systems, and regulatory safeguards mandating human oversight of critical cognitive processes are actively developed [OECD 2019; European Union 2024]. These measures constrain algorithmization, preserving cognitive independence and reflexivity in *Homo connectus* environments.

AER quantifies the share of decisions made independently of external systems, offering a metric to assess risks of losing authentic experience under algorithmic mediation. Even in cases where algorithms act autonomously, AER enables evaluation of residual human cognitive involvement. Ethical constraints and regulatory instruments must be explored to ensure equilibrium between system efficiency and human-centered autonomy.

The quantitative measurement and interpretative application of AER across knowledge, education, and professional domains require coordinated engagement among researchers, engineers, and lawmakers. Valid methodology demands expert consensus, long-term development, and adaptability to evolving infrastructures[1]. Safeguarding zones of autonomous action in cognitive, educational, and occupational processes remains essential for preserving subjectivity in the *Homo connectus* environment.

Conclusion

This study conceptualized cognitive transformations induced by IoT infrastructures and their impact on subjectivity, knowledge, education, and professional activity. IoT functions as a materialized form of cognitive practice, simultaneously restructuring cognition through algorithmization, connectivity, and service dependency.

Connectivity reshapes cognition, reduces autonomous action, and embeds human-environment interaction within service-mediated structures. Delegation of orientation, interpretation, and decision-making to technical systems restructures autonomy and constrains individual problem-solving capacity. Anthropogenesis shifts toward platform dependency and technical mediation.

Homo connectus represents a structurally dependent subjectivity emerging within IoT environments, characterized by algorithmic sense-making, platformization, and constrained cognitive autonomy.

Knowledge, education, and professional competencies increasingly depend on technical infrastructures, diminishing autonomy and modifying cognitive configurations. AER serves as a quantitative metric for assessing autonomy levels across connected environments.

Key contributions of this research include:

- Defining IoT as a materialization and transformation of cognitive practice;
- Identifying anthropogenetic shifts toward infrastructural dependency and algorithmic cognition;
- Revealing structural transformations in knowledge, education, and professional competence;
- Conceptualizing *Homo connectus* as a dependent subjectivity type;
- Introducing AER as a tool for autonomy assessment within connected environments.

All research objectives were consistently addressed and substantiated. IoT was analyzed as a technical mode of cognitive practice encompassing social,

[1] For precise AER measurement, we propose a stepwise protocol. First, define explicit criteria for "autonomous" scenarios—actions by users or devices executed without third-party algorithmic or operator intervention. Then, collect data using (a) content analysis of manufacturer technical documentation, (b) structured interviews with IoT users, and (c) experimental observation in controlled conditions. AER is calculated as the ratio of autonomous to total behavioral scenarios in the sample. Reliability is tested using the Cramér–von Mises distribution test and Cronbach's alpha for internal consistency. Only statistically validated AER values qualify for use as autonomy assessment metrics.

educational, and institutional dimensions. The study revealed risks of algorithmic restructuring, autonomy erosion, and dependency inherent to Homo connectus environments.

Future research should focus on empirical AER validation, longitudinal autonomy dynamics, analysis of *Homo connectus* dependency effects, and development of technological, educational, and regulatory strategies for safeguarding cognitive autonomy within digitally mediated infrastructures. Without such measures, Homo connectus risks not only diminished autonomy but erosion of subjectivity itself through habitual delegation of cognitive agency.

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Богдан Падалко. **Когнітивна практика в епоху Інтернету речей: Ave, Homo Connectus!**

У статті здійснено філософський аналіз трансформації когнітивної практики людини під впливом технічного середовища Інтернету речей (IoT). Показано, що IoT функціонує як форма матеріалізації, алгоритмізації та технічної модифікації когнітивної практики, що змінює структуру пізнання, сенсотворення й соціальної взаємодії. Встановлено, що підключення до технічного середовища знижує автономність суб'єкта, змінює механізми орієнтації, пізнання й ухвалення рішень. Посилюється залежність від платформ, алгоритмічних структур і цифрових протоколів, що формує нову сервісно-опосередковану структуру когнітивної активності. Зафіксовано зміщення антропогенезу у бік технічного посередництва пізнання та сервісної залежності. Сформульовано поняття людини підключеної (Homo connectus) як нового типу суб'єктності, що функціонує у сервісно-алгоритмічному середовищі з делегуванням когнітивної автономії технічним системам. Визначено основні характеристики Homo connectus: технічну опосередкованість дій, платформну залежність, алгоритмічне сенсотворення, зміну соціальної структури та обмеження рефлексивної дії. Запроваджено аналітичний показник Коефіцієнт забезпечення автономності (Autonomy-Enabling Ratio, AER), що дозволяє кількісно оцінити рівень когнітивної автономії у середовищі підключення. Показано, що AER фіксує ступінь автономності у сферах пізнання, освіти, професійної дії та сенсотворення, а також демонструє ризики зниження автономії під впливом технічного середовища. Стаття поглиблює філософське осмислення взаємозв'язку технічного середовища, когнітивної автономності та соціальної суб'єктності у цифрову епоху, окреслює нові методологічні інструменти для аналізу автономності у складних соціотехнічних системах.

Ключові слова: *Інтернет речей, когнітивна практика, автономність, філософія IoT, сервісна залежність, коефіцієнт забезпечення автономності, Homo connectus.*

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