

Epistemological and Cultural Critique of Digital Technology and Its Impact on Knowledge Production and Scientific Research

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Abstract:

Contemporary digital transformation has raised anew the ontological question concerning the relationship between humans and technology in the digital realm, as a moment of rupture rather than merely a natural transition from an anthropological and cultural condition to a new context. Rather, it constitutes a practice and a mode of belonging situated between human history and the present, which has paved the way for questioning and investigating the nature of this new relationship.

Accordingly, this study discusses the epistemological and cultural crisis resulting from the acceleration and intensification of digital technology, drawing on three approaches. The first is an onto-epistemological approach represented by Bernard Stiegler in his theorization of the relationship between humans and technology; the second is a cultural approach represented by Nicholas Carr in his observation of the cognitive transformations affecting the brain and patterns of thinking; and the third is represented by Luciano Floridi through the philosophy of information as a new form of independence from classical knowledge. The study problem is crystallized in the idea that technology does not automatically deprive us of meaning; rather, it redefines the conditions of its production and competes for attention and time. The paper concludes that the absence of critical awareness and supportive educational institutions threatens to lead to epistemological superficiality and narrative fragmentation, whereas understanding technology as a space of conflict opens up a renewed possibility for reconstructing and directing meaning.

Keywords: Digital Transformation; Bernard Stiegler; Nicholas Carr; Luciano Floridi; Knowledge Production; Critique.

Introduction

Contemporary digital transformation has constituted a decisive anthropological and epistemological moment in the history of the relationship between humans and technology. Technology is no longer merely an external tool that facilitates human action; rather, it has become an active structure that reshapes consciousness, memory, and patterns of perception themselves. In this context, Bernard Stiegler's project emerges as one of the most profound philosophical projects that sought to ground the relationship between technology and humans ontologically, while Nicholas Carr represents a critical cultural voice that draws attention to the cognitive transformations brought about by digital media in the brain and patterns of thinking. Likewise, Luciano Floridi's contribution emerges as a new vision concerned with framing the philosophy of information and rearranging the relationship between humans and the scientific digital condition. Despite the differences in the theoretical starting points of these thinkers, the purpose of this research is to identify the point of convergence and diagnose a cultural and epistemological crisis caused by the accelerated nature of digital technology.

Accordingly, the fundamental problem of this research does not lie in the fact that technology directly deprives us of meaning, but rather in the fact that it redefines the conditions for its production. If this transformation is not accompanied by critical awareness and educational and cultural institutions capable of redirecting its use, the risk of sliding toward epistemological superficiality and narrative fragmentation remains. However, if technology is reconsidered as a field of struggle over attention and time, it may become a possibility for reconstructing meaning rather than undermining it. From this perspective, the central problem of the research can be formulated through the following main question: How does contemporary digital transformation redefine the conditions for the production of meaning, and what are the implications of this transformation for human cognitive awareness?

This problematic question gives rise to a set of sub-questions:

- How does Bernard Stiegler ground the relationship between humans and technology ontologically, and what does he mean by the loss of knowledge?
- What is the nature of the cognitive and neurological transformations that Nicholas Carr identifies in the human brain as a result of the use of digital media?
- Where does Stiegler's ontological philosophical approach converge with Carr's cognitive cultural critique in diagnosing the crisis of contemporary consciousness, and where do they diverge?
- How can educational and cultural institutions redirect digital use in order to transform technology from a space for dismantling narratives and dissipating time into a vital field for reconstructing meaning?

In order to address the dimensions of this problematic, this research seeks to achieve a number of principal objectives, most notably: deconstructing the epistemological mechanisms through which contemporary technology reshapes consciousness; conducting a critical comparative

approach between Bernard Stiegler's ontological thesis and Nicholas Carr's cultural and neurological approach in order to identify the points of convergence and divergence between them; and ultimately exploring institutional (educational and cultural) avenues capable of reconstructing meaning.

The study adopts the critical analytical method as a primary tool for deconstructing the philosophical and epistemological concepts of the thinkers. It also employs the comparative method at its epistemological and cognitive level to connect Stiegler's ontological depth with Nicholas Carr's empirical observations, ultimately constructing an integrated critical perspective toward this digital transformation.

1. Cultural Critique of Technology between Bernard Stiegler and Nicholas Carr

Stiegler starts from a radical thesis according to which humans are technological beings from the outset, and technology is not an incidental addition to human nature but rather a condition of its formation. Unlike animals, humans live outside themselves through what he calls the "exteriorization of memory (Stiegler, 1994, p. 52)," that is, the storage of experience in tools and media outside the body. This idea leads him to speak of "tertiary memory," or technological memory (Stiegler, 1994, p. 56), which is added to biological and psychological memory. Writing technologies, followed by printing and then digital media, are not merely means of transmitting information; rather, they are forms through which human time itself is constructed. For Stiegler, consciousness is always connected to technological supports that preserve its traces and enable its transmission across generations.

However, this anthropological grounding of technology does not imply adopting a celebratory position toward it. Stiegler draws upon the Platonic concept of the *pharmakon* (remedy/poison) to describe technology as always possessing a dual character: it is a condition of possibility for culture, but in certain contexts it may become a tool for destroying critical capacity. In the digital age, Stiegler argues that cognitive capitalism has appropriated the technological structure and transformed it into a massive apparatus for the depletion of attention (Stiegler, 1996, p. 40). Algorithms and social media platforms work to transform attention into a commodity and reshape desires according to the logic of the market, leading to what he calls "de-individuation," that is, the production of standardized subjects subject to the rhythm of rapid consumption.

From this epistemological perspective, the crisis is not merely a crisis of information or technology, but rather a crisis of a decisive moment whose most prominent feature is digital media, which introduces consciousness into an immediate and fragmented temporality in which the reflective continuity that constitutes a condition for the formation of the thinking subject is weakened. The loss of the ability to concentrate for long periods, the decline of careful reading, and the transformation of knowledge into an instantaneous flow of data are all manifestations of a deeper crisis affecting the relationship between humans, their memory, and their future. Nevertheless, Stiegler remains committed to the possibility of redirecting technology through the development of a "politics of attention" that restores value to formation, education, and profound cultural practices.

Nicholas Carr, for his part, operates at a different level from Stiegler, as he is closer to cognitive cultural analysis than to ontological grounding. In his famous article published in *The Atlantic*

magazine and subsequently in his book *The Shallows*, he argues that the digital world does not merely change our habits but also reshapes our brains themselves (Carr, 2010, p. 98). Drawing on research in neuroscience concerning brain plasticity, Carr argues that intensive use of digital media reinforces patterns of rapid and fragmented thinking, but at the same time weakens the capacity for deep concentration and analytical reflection.

2. Critique of Technology and Its Impact on Social Transformation

Carr points out that traditional reading, particularly the reading of printed books, trained the mind in immersion and sustained concentration, whereas the digital environment encourages jumping between links and dealing with short sections of texts. This transformation does not concern the content but rather the medium itself. According to Carr, every medium implicitly carries a cognitive model. Just as printing contributed to consolidating linear and systematic thinking, the Internet promotes fragmented networked thinking. In his view, the problem is that this new pattern may undermine the epistemological foundations upon which modern human culture has been built, including critical thinking and in-depth scientific research (Carr, 2008, p. 102).

All of this was inferred by Nicholas Carr from his own experience, which points to a crisis affecting an entire generation: distraction and the inability to immerse oneself in extended reading. Users engage in what is known as “skimming” and move instantaneously between links without completing texts (Carr, 2008, pp. 56–57). Carr historically compares this transformation with the invention of the “mechanical clock,” which reorganized human perception according to rigid patterns. He explains that the Internet today consumes the remaining cognitive media and forces us to adopt a rapid and fragmented feedback style, ultimately leading to a dangerous paradox: in our pursuit of automating our mental processes, we gradually become cold machines and lose what most deeply distinguishes human thought, namely the capacity for contemplative and emotional immersion (Carr, 2008, p. 63).

In his article “Is Google Making Us Stupid?”, Carr warned that this pattern drives humanity toward abandoning the knowledge stored within deep memory in favor of total reliance on external cloud memory, ultimately threatening to produce mechanical minds devoid of the faculty of critical reflection and the spiritual depth that has characterized human culture for centuries (Carr, 2008, p. 63).

Although Carr did not provide a practical solution, a precise diagnosis, or a ready-made prescription for overcoming this problem, his article entitled “Is Google Making Us Stupid?” served as a warning cry to sound the alarm and as an attempt to diagnose the crisis and describe the cognitive and psychological changes experienced by humans in the contemporary period. At the end of his article, Carr acknowledged that he might be accused of “nostalgia” (excessive longing for the past) and of resisting digital technology in a manner similar to Socrates’ resistance in ancient times to the emergence of writing (Carr, “Is Google Making Us Stupid?”, 2008, pp. 62–63). Nevertheless, when he later developed his ideas in his book *The Shallows* and in the intellectual interviews that followed the article, he began to discuss aspects of the “solution” or confrontation.

Although Carr does not develop a comprehensive philosophical theory of technology, he converges with Stiegler in diagnosing the phenomenon of the erosion of attention and the

decline of deep reading. However, the fundamental difference between them lies in the level of analysis: Carr focuses on the individual brain and its neurological transformations, whereas Stiegler links the issue to the economic and political structure of cognitive capitalism. For Carr, the crisis is a crisis of concentration and perception, whereas for Stiegler, it is a crisis of individuation, time, and desire.

It can be said that Carr's project provides a concrete empirical diagnosis of the cognitive effects of digital technology, while Stiegler provides the broader conceptual framework for understanding these effects within a historical and anthropological context. When Carr speaks of mental distraction, this distraction can be interpreted in light of Stiegler's analysis of the attention economy; and when Carr warns against the decline of deep reading, Stiegler provides an explanation for this in terms of the loss of the temporal accumulation necessary for the formation of the subject.

The question remains open as to the extent of the accuracy of this critical diagnosis. Some argue that digital media do not eliminate deep thinking but rather reshape it into new forms, and that networked transformation may open unprecedented possibilities for cognitive collaboration. Nevertheless, the value of Stiegler and Carr's critique does not lie in nostalgia for the past, but in reminding us that technology is not a neutral destiny and that the forms of mediation upon which we rely influence the formation of our consciousness itself.

The cultural critique of technology offered by Stiegler and Carr thus reveals a radical transformation in the understanding of the relationship between humans and technology. Technology is no longer merely an external means; rather, it has become a cognitive environment that shapes the conditions of possibility for thinking, memory, and desire. While Stiegler calls for the repoliticization of technology and the construction of institutions that restore value to individuation and attention, Carr calls upon us to develop daily critical awareness of our digital habits and how we use them. Between profound ontological analysis and concrete cognitive diagnosis, the two projects complement one another in raising a crucial question: How can humans preserve their capacity for deep thinking in an age dominated by speed and the instantaneous flow of information?

Technology and the Crisis of Meaning in Postmodern Societies

If we examine Stiegler's and Carr's analyses from a broader philosophical and sociological perspective, we can situate them within a more comprehensive question concerning the crisis of meaning in contemporary societies. Postmodern societies, as they are commonly described, are characterized by the fragmentation of grand narratives, the acceleration of the temporal rhythm, and the intensification of the flow of information. However, digital transformation does not merely represent an expression of these characteristics; rather, it constitutes their deep structural mechanism.

Stiegler argues that the crisis of meaning is connected to the fragmentation of subjective time. Meaning can only be formed through the accumulation of memory and its reinterpretation within a future horizon. However, when consciousness becomes a point of passage for an uninterrupted stream of digital stimuli (Stiegler, 2008, p. 66), the individual loses the ability to construct their own narrative. The de-individuation he discusses is not merely cultural homogenization, but rather the loss of the ability to produce an independent subjective

meaning. Here, his critique of technology intersects with his critique of cognitive capitalism: when desire is reduced to immediate consumption, the horizon of meaning is narrowed to momentary gratification.

As for Carr, although he does not develop his thesis in the language of the philosophy of meaning, as he expresses it through a media-oriented language representing his field of specialization, his analysis of the erosion of deep reading leads to a similar conclusion. Careful reading of major texts has historically been one of the mechanisms for producing cultural meaning, as it allows for reflection and comparison and for the construction of complex conceptual connections. If this practice is replaced by a rapid and fragmented mode of browsing, the result is not merely weakened concentration, but also a decline in the ability to construct interconnected systems of meaning. Thus, consciousness becomes a surface upon which numerous pieces of information coexist without crystallizing into a coherent vision.

It can be said that digital transformation is reshaping the very conditions for the production of meaning. Meaning requires time, continuity, and concentration (Carr, 2014, p. 39), whereas the digital environment is based on immediacy and fragmentation. Hence, the question of technology becomes an anthropological question: What kind of subject is formed within this environment? Are we witnessing a structural transformation in the mode of human consciousness, or are we facing a transitional phase whose outcomes have not yet fully emerged?

The importance of bringing Stiegler and Carr together lies in highlighting two complementary levels of the crisis: a neurological-cognitive level related to the mechanisms of attention and concentration, and a cultural-political level related to the economic structure that directs technology. While Carr draws attention to the need for awareness of our digital habits, Stiegler goes further by calling for the reconstruction of educational and cultural institutions capable of transforming technology from a tool for commodifying attention into a means of expanding individuation and creativity.

The fundamental problematic can also be reformulated as follows: the problem does not lie in technology directly depriving us of meaning, but rather in its redefinition of the conditions for producing it. If this transformation is not accompanied by critical awareness and educational and cultural institutions capable of redirecting its use, the risk of sliding toward epistemological superficiality and narrative fragmentation remains. However, if technology is reconsidered as a field of struggle over attention and time, it may become a possibility for reconstructing meaning rather than undermining it.

4. The Philosophy of Information as a Study of Transformations from the Given to the Structure (Luciano Floridi)

The philosophy of information is considered one of the modern philosophical fields that seeks to understand the nature of information as a fundamental component of reality. Information is no longer understood merely as a representation of reality; rather, it is viewed as an element that constitutes it. The digital world does not merely reflect reality but also reproduces it through data and algorithms.

This transformation requires a reconsideration of the relationship between knowledge and truth in terms of the new conceptual formations closely associated with new technology. In the

context of the enormous flow of information, the challenge is no longer access to knowledge, but rather distinguishing knowledge that leads to scientific truth from falsehood that disturbs meaning and increases the number of questions concerning epistemological utility and reliability. Furthermore, algorithms that classify information and direct access to it have themselves begun to play a role in shaping what we consider to be truth in the philosophical and reflective sense, raising a philosophical question concerning the objectivity of knowledge in the digital age.

This situation has led to the emergence of a new conception of humans as “informational beings” (Floridi, 2011, p. 56), living within a vast digital system and within a network of data, and interacting with the world (I–Other) through digital media. This makes the philosophy of information not merely a technical analysis, but rather a reflection on the nature of human existence and critical epistemology in the age of digitization.

The so-called digital age has also changed the nature of scientific research in terms of its tools, methodology, objectives, and results. Researchers no longer rely solely on direct observation, theoretical critical analysis, or scientific epistemological analysis; rather, they have come to rely on massive databases, advanced statistical analysis tools, and algorithms capable of extracting patterns from data, creating a gap between the human capacity for critical analysis and the abundance of information that overwhelms direct knowledge.

This transformation has provided enormous possibilities for the development of knowledge, but at the same time it has created new challenges. On the one hand, research has become faster and broader; on the other hand, it has become vulnerable to the risks of haste, inadequate verification, and excessive reliance on automated results (Floridi, 2014, p. 177).

Digitization has also led to a change in the nature of scientific production, as knowledge is increasingly produced collectively and collaboratively through digital platforms. This raises a question concerning the limits of individual responsibility in scientific research: Does the researcher remain responsible for everything they produce, or is responsibility distributed between humans and machines?

5. Research Ethics in the Digital Age: Emerging Issues

Research ethics in the digital age arise within a complex context in which scientific, technological, and legal considerations intersect. Among the most prominent issues is the question of scientific credibility, which has become more complex in light of the ease of accessing and redistributing information. The phenomenon of scientific misconduct (plagiarism) is no longer limited to direct copying, but also includes reformulating ideas without documentation or using artificial intelligence tools to produce texts without acknowledging their use.

Data protection has also become a central issue, particularly in research that relies on personal or sensitive data. Researchers are required to preserve participants’ privacy and ensure that information is not misused.

Transparency represents a fundamental pillar of research ethics, as researchers should clarify their methodology, sources, and tools, including the use of algorithms or intelligent software. The absence of transparency may lead to misleading results or a loss of confidence in scientific research (Tammar, 2019, p. 43).

In addition, the issue of algorithmic bias emerges, as intelligent systems may reflect biases embedded in the data on which they were trained, thereby affecting research results. This imposes upon researchers the responsibility to critically examine the tools they use and not to treat them as neutral data.

Addressing these challenges requires the establishment of a new ethical framework appropriate to the nature of the digital age. This framework should be based on a set of fundamental principles:

1. The Principle of Epistemic Responsibility: This requires researchers to maintain critical awareness of their tools and their results and not to rely solely on what algorithms provide without scrutiny.
2. The Principle of Digital Transparency: This requires disclosure of the methods used to collect, process, and analyze data, thereby ensuring that the results can be verified.
3. The Principle of the Protection of Human Dignity: This establishes limits on the use of data and prevents its exploitation in ways that infringe upon individuals' rights.
4. The Principle of Epistemic Justice: This seeks to reduce the digital divide, ensure equitable access to knowledge, and prevent its monopolization by particular institutions or companies.

It should be noted that these principles do not merely represent procedural rules; rather, they reflect a transformation in our understanding of the researcher's role in society. The researcher is no longer merely a producer of knowledge, but has become an ethical actor responsible for the effects of their work in the digital world.

Conclusion

At the end of this research, we conclude that contemporary digital transformation is not merely a technological transition in the tools of knowledge production, but rather a radical anthropological transformation that reshapes the nature of the human being, the nature of their consciousness, and the conditions for the formation of their identity. The philosophical inquiry pursued in this research through the theses of Stiegler, Carr, and Floridi reveals that the real crisis does not lie in technology itself as a set of inanimate tools, but rather in the structure of digital existence, which has come to monopolize human time and colonize attention, transforming the thinking subject from a contemplative entity that produces meaning through accumulation and continuity into merely a number in the digital equation, or simply a networked point of passage within an endless flow of fragmented and instantaneous data. The epistemological and cultural critique of digitization places humans before a sharp philosophical paradox. In an age in which human knowledge has reached an unprecedented level of abundance and flow, the human mind faces the danger of epistemological limitation and superficiality as a result of the decline of deep reading and linear thinking in favor of the automation of mental processes and absolute reliance on external cloud memory. This crisis is no longer confined to the individual but has extended to the structure of scientific research, which now oscillates between the explosion of massive data and the absence of the critical and reflective distance necessary for scrutinizing truth.

The critical philosophical approach does not aim to condemn technology or express a desire to return to a pre-digital era. Rather, it invites us to understand modern technology as a dual phenomenon (remedy and poison), encompassing both the risks of dependence and the

opportunities for liberation. Since we are facing the challenges of cognitive capitalism and automation applications, there is an urgent need to develop a new ethical and epistemological framework founded on essential principles that should not be overlooked: intellectual responsibility, data transparency, the protection of human dignity, and the achievement of justice in the distribution of knowledge.

The restoration of meaning in the digital age requires educational and cultural institutions to regain their ability to transform the digital space from an arena for distracting the self and dissipating time into a vital domain for restoring individuation and creativity. It is an open call to establish a new politics of attention that ensures that humans do not become cold machines in their pursuit of automating the world, and that affirms that the value of knowledge is not measured by the abundance of data, but by the depth of awareness and its capacity to preserve the freedom of human thought and its spiritual and ethical integrity.

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