CONSCIOUSNESS AND IDENTITY AS DISTRIBUTED INFORMATIONAL PROCESSES: A PHILOSOPHICAL FRAMEWORK FOR INFORMATION SCIENCE

Adelino Carbonera

Independent Researcher, Italy

carcinque@outlook.it

ABSTRACT

This article explores consciousness and identity as distributed informational processes, bringing philosophical reflection into dialogue with information science. Starting from the interconnection between artificial intelligence, neural networks, and data ecosystems, the work proposes a conceptual framework that interprets consciousness as an extended field, identity as modulation and resonance generated through interaction with social and technological environments, and relation as a permeable threshold that filters and transforms informational flows. Through engagement with information science — neural networks, social computing, digital humanities — ethical and social implications are highlighted, including transparency, informational justice, and shared responsibility. The article does not aim to provide a technical model but rather to offer critical tools for understanding the relational nature of information systems and for guiding design toward more equitable and inclusive forms.

KEYWORDS

Distributed consciousness, permeable interfaces, social computing, ethics of information systems, digital humanities.

1. INTRODUCTION

In recent decades, the expansion of information technologies has radically transformed the way we think about consciousness, identity, and relation. The intertwining of artificial intelligences, neural networks, and data ecosystems is not merely a technical phenomenon, but a cultural shift that redefines the categories through which we interpret experience. Consciousness, traditionally understood as contained within the body and the skull, today appears as a distributed and permeable field [1], capable of extending itself through digital interfaces and environments. Identity no longer presents itself as a fixed structure, but as a rhythmic and modulatory process, continuously reshaped by interactions with informational and social systems [2].

We may ask how consciousness and information can be rethought beyond the individual container, how they become phenomena that extend and intertwine with technological and social networks. From this perspective, every perception is already relation, every identity is already modulation, every stability is already rhythm. Information systems are not merely computational tools, but membranes that amplify and rewrite our experience, producing new forms of interconnection and new possibilities of meaning.

This transformation concerns not only the personal dimension, but invests the entire collective fabric. Information is no longer a simple datum to be stored or transmitted, but a dynamic field that modulates behaviors, relations, and perceptions. In this scenario, philosophy can offer

valuable conceptual tools: not to replace information science, but to accompany it, clarifying the deeper implications of a world in which consciousness is distributed and identity is redefined [3].

The article intends to explore these implications, showing how theoretical reflection can engage in dialogue with information science and contribute to rethinking the interconnected nature of consciousness. The aim is not to propose a technical model, but to outline a conceptual framework that allows us to interpret information systems as spaces of experience and transformation, capable of restoring new forms of unity within plurality.

2. THEORETICAL FRAMEWORK

2.1. Consciousness as an extended informational field

The classical conception of consciousness as a process confined to the brain or as the sum of discrete cognitive functions appears increasingly inadequate to describe the complex interaction between human beings, digital environments, and information systems. A perspective more consistent with contemporary models of information theory consists in interpreting consciousness as an extended informational field [1], characterized by flows, interferences, and integrations that simultaneously traverse biological, technological, and social dimensions.

From this perspective, consciousness is not a localization but a dynamic configuration, an emergent pattern generated by the interaction among neural networks, communication networks, intelligent devices, and digital infrastructures. Analogous to physical fields, it can be described as a distributed system that integrates data and signals from heterogeneous sources.

Every perceptual act becomes a point of convergence among informational flows; every conscious state, a temporary result of the synchronization between cognitive processes and socio-technical environments.

This model is consistent with the contemporary development of information systems, which operate through constant interconnections between human and non-human agents. Consciousness, therefore, can be seen as a trans-biological phenomenon, fueled and modulated by interactions that transcend individual boundaries and involve digital networks, extended memories, knowledge representation systems, and collective informational dynamics.

2.2. Identity as informational echo and modulation

Interpreting consciousness as a field implies a profound rethinking of the concept of identity. Rather than a stable and defined structure, identity can be understood as informational echo, the result of resonance processes that continuously transform data originating from social, cultural, and digital environments [2].

Identity emerges as a dynamic configuration of signals coming from multiple domains: online social interactions, algorithmic representations, recommendation systems, digital educational practices, computerized work contexts, policies of data archiving and curation. It is therefore not a “datum” but a process of continuous modulation, analogous to the feedback loops of complex systems.

From this perspective, every individual is the result of an informational trajectory, a series of transformations generated by the absorption, reinterpretation, and re-elaboration of data. Every informational exchange produces an identity variation; every interaction introduces new resonances.

Identity thus becomes an emergent process reflecting the dynamic, distributed, and interconnected nature of contemporary informational ecosystems [3].

2.3. Relation as membrane: informational interference and filtering

Relations do not constitute mere contacts between already formed entities, but genuine phenomena of informational interference. The metaphor of the membrane proves particularly effective in describing this process: relation functions as a semi-permeable threshold that selects, transforms, and modulates informational flows.

The membrane is not a barrier, but an active device: it filters signals, creates translations, establishes priorities, and produces new configurations of meaning. On the biological plane, analogous processes can be observed in neuronal synchronization; on the technological plane, in intelligent interfaces, search engines, recommendation systems, and devices for filtering and aggregating content.

Within information systems, the relation between agents — human and non-human — takes the form of an interaction-membrane, in which information does not merely transit but is reinterpreted and restructured. This model allows us to understand how new forms of meaning, new identities, and new behaviors emerge from processes of informational interference among individuals, algorithms, and databases.

2.4. Rhythm as principle of dynamic stability in complex systems

Contemporary information systems operate through cycles, oscillations, and regimes of synchronization that ensure internal coherence despite the constant variability of data. In this context, the concept of rhythm assumes a fundamental role as a principle of dynamic stability.

Rhythm can be defined as the set of adaptive regularities that allow the system to integrate differences without losing cohesion. It can be traced in the update cycles of algorithms, in the periodicity of data processing, in the stability of feedback loops, in the oscillations that characterize both biological and digital systems.

Rhythm enables an informational system to distinguish signals from noise, to maintain functional continuity, and to integrate variations without collapse. Stability does not emerge from the absence of change, but from the system's ability to coordinate differences, generating a form of dynamic equilibrium.

In this sense, rhythm represents the principle that harmonizes field, echo, and membrane: it guarantees the coherence of the overall informational process, making possible the continuity of experience, identity, and interactions within complex and distributed systems.

2.5. Theoretical synthesis

The conceptual framework outlined can be synthesized in the following principles:
- Field: consciousness as a distributed and relational informational system [1].
- Echo: identity as modulation and resonance generated through interaction with social and technological environments 2][3].
- Membrane: relation as a permeable threshold that filters and transforms informational flows.
- Rhythm: the principle of dynamic stability that ensures coherence in complex systems.

This perspective offers a significant theoretical contribution to the contemporary debate on information science, proposing an integrated vision that connects cognitive dynamics, socio-technical systems, digital architectures, and complex models of data processing [5].

3. DIALOGUE WITH INFORMATION SCIENCE

3.1. Neural networks and distributed configurations

Contemporary artificial intelligence architectures — in particular deep neural networks — clearly demonstrate that knowledge emerges from distributed configurations rather than hierarchical centers [1]. Each node in a neural network participates in an activation process that, while locally simple, contributes to the formation of complex global patterns. The capacity for inference does not reside in the single element, but in the ensemble of connections and weights that change over time.

This paradigm is fundamental for information science, as it suggests that information itself is not an isolated unit but a relational event: a point of convergence produced by dynamics of propagation, feedback, and adaptation. The distribution, redundancy, and plasticity of neural networks thus become a theoretical model for understanding human, social, and cultural information systems as well.

Applied to the comprehension of cognitive and socio-informational processes, this model highlights how knowledge — both biological and artificial — is constituted within webs of connection where meanings emerge from correlations, interferences, and co-activations. Knowledge becomes a networked phenomenon, a probabilistic configuration constantly updated and reshaped according to the informational flows that traverse it.

3.2. Social computing and permeable interfaces

Social computing reveals how digital identity is a processual and modular entity, constructed through highly permeable interfaces that collect, process, and redistribute informational traces in real time [4]. Every like, comment, search, view, or navigation pattern generates data that feed predictive models and visibility algorithms.

This ecosystem confers upon identity a profoundly plastic and adaptive nature: identity does not appear as a stable profile, but as a sequence of informational states continuously renegotiated through exchanges among users, platforms, algorithms, and social networks.

Digital interfaces act as computational membranes that filter signals, select what is made visible, and reconstruct models of the self based on interaction metrics. This produces a vision of the individual as a resonance node: a point of interference between incoming data, algorithmic interpretations, and community communicative practices.

In this sense, social computing does not merely describe online behavior, but reveals the functioning of amplified resonance systems in which individual and collective perception is constructed through cycles of response, feedback, and informational recomposition.

3.3. Digital humanities and cultural resonances

The digital humanities provide decisive methodological tools for understanding the dynamic and stratified nature of contemporary informational flows [6]. Computational analysis of textual corpora, topic modeling techniques, semantic networks, interactive visualization of cultural data, and studies of narrative patterns show how digital culture is traversed by cycles, variations, recursive movements, and rhythmic transformations.

Every document — text, image, audio, video, archival data — can be understood as a cultural resonance, that is, as a unit that amplifies or attenuates depending on the networks in which it circulates. Repetition is never identical: what returns is modified according to the informational context that receives it.

These techniques allow us to observe cultural phenomena such as:
- the diffusion of narratives,
- the transformation of languages,

- the emergence of new thematic patterns,
- the convergence between digital and material cultures,
- the formation of distributed collective memories.

The dynamics revealed in the digital humanities confirm that culture operates as a rhythmic ecosystem, in which informational time produces continuous variations, divergences, and reorganizations. Digital culture is therefore not a static archive, but a living field of differences that repeat and reinterpret themselves.

3.4. Ethics of permeability

The permeability of information systems introduces an indispensable ethical dimension. Every system that admits flows, exchanges, and interferences generates possibilities but also vulnerabilities. Permeability, in fact, is a dual principle: it enables interaction but also opens spaces of exposure. For this reason, informational ethics must address not only data protection but also the care of the relations that data activate [5].

Issues of algorithmic transparency, accountability, equity of access, bias in inferential practices, and informational justice derive directly from the permeable and interconnected nature of digital infrastructures. In a networked environment, every computational decision generates effects that propagate through complex systems, influencing individuals, communities, and institutions.

This requires an ethics of shared responsibility, capable of ensuring:
- equity in processing,
- transparency in data transformations,
- plurality in representations,
- protection of differences,
- recognition of systemic vulnerabilities.

In a permeable informational system, ethics cannot be limited to defense against external intrusions; it must promote the relational management of informational flows, recognizing that every datum is already relation, every configuration is already interference, and every transformation reverberates across networks broader than those immediately visible.

The ethics of permeability therefore requires a vision that considers knowledge not as possession but as traversal; not as object but as interactive process. Such a perspective fosters responsible practices that not only mitigate risks but also enhance the generative capacity of interconnections.

4. DISCUSSION

The operational implications of the proposed conceptual framework invite us to rethink data management, the design of digital platforms, and transparency policies according to a logic more attentive to the relational nature of information systems. Considering data not as neutral entities but as elements generated by a network of interactions implies that their management must go beyond traditional criteria of preservation, efficiency, and accessibility. It becomes necessary to introduce forms of documentation capable of restoring the context of production, institutional or community provenance, intermediate interpretations, and the effects that such data produce once reintroduced into informational circuits. Contextual metadata, provenance records, and more articulated descriptive practices thus assume a decisive role in ensuring visibility, traceability, and comprehensibility. Moreover, the adoption of such tools fosters a more precise understanding of emerging phenomena, as it allows us to observe how data are transformed while traversing infrastructures, policies, and classification systems, making the informational process more legible and controllable.

From this perspective, the metaphor of the permeable interface suggests that information systems should be designed not to eliminate permeability but to govern it [5]. Responsible design requires interfaces that make explicit the transformations operated by algorithms, dynamic consent tools capable of adapting to new circumstances, and more granular mechanisms of control over the circulation of information. Such an approach enables users to understand and modulate the informational exchanges that concern them, reducing the asymmetry between those who produce data and those who process them. Conscious permeability can, in this sense, become a tool of empowerment rather than a factor of vulnerability, provided that it is adequately communicated and made governable by those involved.

The theme of transparency expands in a similar way. The mere publication of code or logs is not sufficient to guarantee comprehensibility. Transparency must be understood as an interpretive practice, in which algorithmic decisions are rendered intelligible through tools capable of creating bridges between technical and social dimensions [3]. Approaches such as dynamic visualizations, contextual explanations, or scenario simulations become essential to restore to the user an active role in understanding the system. Transparency, to be effective, must integrate with pedagogical practices and communicative devices that facilitate interpretation and make even the less intuitive logics of intelligent systems accessible. This implies a capacity to narrate the functioning of systems that goes beyond the technical sphere and requires care in communication, form, and language employed.

In relation to social justice, a vision that conceives identity and experience as resonances produced within complex informational environments shows how inequalities do not emerge solely as bias in data but also as distortions in resonances that amplify marginalizations and asymmetries. Ensuring equity therefore requires impact assessments sensitive to social networks, their long-term dynamics, and the transformations of informational ecosystems. Informational justice cannot be reduced to the technical correction of errors but must include forms of symbolic repair and reintegration into digital communities.

At this level, it is useful to highlight three dimensions that ethical governance should recognize:
• the cumulative effects of distortions, which amplify over time through chains of algorithmic decisions and recommendations;
• the emotional and identity impact of algorithmic errors, often neglected in technical evaluation processes;
• the shared responsibility among public, private, and community actors, necessary so that justice does not fall entirely upon a single institutional subject.

These dimensions show how the ethical management of information systems must be multi-level, oriented both to prevention and to the care of the wounds produced by informational processes.
Effective governance must assume a rhythmic and iterative character. Since information systems change constantly, policies must be subjected to periodic revisions, recurrent monitoring, and processes of institutional learning. This approach makes it possible to avoid normative rigidity and to respond with greater flexibility to technological and social changes. Rhythmic governance is configured as a process of synchronization among norms, technologies, and social practices, in which adaptability becomes a fundamental resource for maintaining coherence and resilience in informational ecosystems.

While offering conceptual advantages, this framework presents certain limits. It does not constitute an immediately operational technical model and requires further translations into metrics, indicators, and engineering protocols. Moreover, the use of metaphors such as “field,”

"interference," or "membrane," if not accompanied by operational definitions, risks appearing ambiguous or lending itself to non-rigorous interpretations. Finally, the proposals confront material and institutional constraints — limited resources, consolidated economic interests, already stabilized technological architectures — that cannot be overcome by theoretical reflection alone.

For this reason, an interdisciplinary approach grounded in experimentation becomes indispensable. The transformation of conceptual intuitions into practices requires pilot projects in which philosophers, computer scientists, designers, jurists, and communities can collaborate. It is in these contexts that theoretical elements can be translated into operational tools, empirically evaluated, and iterated.

Two areas prove particularly relevant:
• critical education, indispensable for enabling users to interpret digital architectures and assess the social impacts of algorithmic systems;
• hybrid laboratories, in which to test interfaces, policies, and governance models in controlled yet realistic environments.

To these two areas, a third can be added, often overlooked but fundamental in international standards:
• the narrative evaluation of technologies, that is, the study of the stories, perceptions, expectations, and social meanings produced by digital infrastructures, a crucial element for understanding the actual acceptability and sustainability of innovations.
Alongside such practices, the need for iterative policies and accountability tools remains central [5]. Periodic reviews, independent audits, public registers of algorithmic decisions, and accessible appeal procedures contribute to building trust and legitimacy. Research oriented toward operational translation — capable of developing metrics of relational equity, protocols for contextual metadata, and dynamic models of impact assessment — represents the necessary bridge between theory and technical implementation.

The discussion thus shows how a conceptual approach can offer significant tools for rethinking the management of contemporary information systems, while recognizing the need for further technical and institutional mediations. The invitation is to a joint and iterative effort, in which theoretical reflection and technical experimentation cooperate to orient the evolution of information systems toward more equitable, transparent, and responsible forms.

5. Conclusion

The path developed in this article has shown how philosophical reflection can fruitfully engage in dialogue with the science and technology of information systems [3]. Starting from the context of the interconnection among artificial intelligence, neural networks, and data ecosystems, we have proposed a conceptual framework that interprets consciousness and identity as distributed processes, modulations, and interferences.

The theoretical framework introduced interpretive images — distributed configurations, cultural resonances, permeable interfaces, dynamic cadences — that allow us to conceive information not as an isolated entity but as a relational phenomenon. These categories have found concrete application in dialogue with Information Science: from neural networks as metaphors of cognitive fields, to social computing as a space of fluid identities, to digital humanities as tools for grasping cultural resonances and variations [6].

The discussion highlighted ethical and social implications: data management is never neutral, but affects transparency, social justice, and shared responsibility [5]. At the same time, we have

acknowledged the limits of this proposal: it is not a technical model, but a conceptual framework that must be translated into operational practices through interdisciplinary collaboration.

In summary, the article suggests that philosophy can illuminate information science by offering critical tools to understand the relational nature of data and to guide the design of information systems toward greater justice, transparency, and inclusiveness. The mission that follows is to accompany technological evolution with critical thought capable of safeguarding plurality, making visible the dynamics of permeability, and transforming interconnection into responsibility.

REFERENCES

[1] E. Hutchins, Cognition in the Wild. MIT Press, 1995.

[2] A. Clark and D. Chalmers, "The Extended Mind," Analysis, vol. 58, no. 1, pp. 7–19, 1998.

[3] R. Lee, "Philosophy and information systems: where are we and where should we go?," European Journal of Information Systems, vol. 27, no. 3, pp. 263–277, 2018.

[4] P. Rocchi and A. Resca, "Searching the Identity of Information Systems: A Study from Interdisciplinary Contexts," in Transfer and Diffusion of IT, IFIP Advances in Information and Communication Technology, vol. 537, Springer, 2018, pp. 295–305.

[5] D. Ribeiro and J. Varajão, "Codes of ethics and conduct in information systems: towards a unified framework," Management Review Quarterly, 2025.

[6] G. Spinaci, G. Colavizza, and S. Peroni, "A map of Digital Humanities research across bibliographic data sources," Digital Scholarship in the Humanities, vol. 37, no. 4, pp. 1254–1268, 2022.

ACKNOWLEDGEMENTS

The author would like to thank colleagues and reviewers for their valuable comments and suggestions.