DIGITAL HUMANITIES IN THE INDIA RIM

Contemporary Scholarship in Australia and India





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6. Digital hermeneutics: Interpretation and the interpretational machines

Prayer Elmo Raj

Abstract

Classical hermeneutics, firmly rooted in the interpretation of cultural artifacts, stands at the precipice of a transformative paradigm shift as interactive digital networks pervade our existence. This essay probes the fundamental transformation brought about by technology, positing it as a dynamic hermeneutic agent with a dualistic magnification-reduction structure. This challenges the conventional notion of technology as a mere replica of reality, demanding a critical re-evaluation of its interpretational potency and its profound impact on comprehension and consequence. Digital hermeneutics unfurls along two distinct trajectories: one focused on the analysis and interpretation of digital-native texts and databases, while the other delves into the intricate dynamics of intentionality in human-AI interactions. The proliferation of digital ontologies necessitates a refined interpretive logic capable of navigating the intricate terrain of humanities research. By engaging with foundational hermeneutic theorists, this essay underscores the materiality intrinsic to language and underscores the transformative potential embedded in signs, symbols, and narratives. It interrogates the implications of digital texts, dismantling established constructs of narrative identity and fostering avenues for dynamic and evolving expressions of meaning. By critically addressing the materiality

of meaning sources and the transformative prowess inherent in digital texts, this comprehensive study lays a foundation for an enhanced hermeneutical framework adept at navigating the intricate web of contemporary communication and information networks.

Keywords

Digital hermeneutics; interpretation; meaning; data; information.

Introduction

Hermeneutics, as the philosophical theory of interpretation and communication, faces challenges occasioned by the existing and emergent digital communication and information networks. Rational interpretations are challenged by global and interactive digital (inter) networks. Classical hermeneutics neglects the intermediaries between the subject and the world. The emphasis on language ignores the materiality and technicity of the sources of meaning. Technologies are personally and collectively encapsulated into various configurations of signs and symbols that arbitrate comprehension and consequences. Nevertheless, language assumes a central position in the relationship between technology and interpretation. Hermeneutics, traditionally concerned with interpretation and understanding, extends its purview beyond the empirical domain of science to encompass the interpretative frameworks that underlie scientific inquiry. According to Ihde (1999), "hermeneutics needs to be understood, not only in relation to science, but in relation to the philosophies of science which, for philosophers, are often taken implicitly for science itself, or for how science is to be understood" (p. 346). In this sense, hermeneutics serves as a metadiscipline that elucidates the processes of interpretation inherent in scientific endeavours, illuminating the role of context, language, and preconceptions in shaping scientific knowledge.

Initially, hermeneutics (*kunstlehre*) is defined as the science of interpreting cultural productions. The fundamental aim of hermeneutics is to accomplish *verstehen* (Bulhof, 1980, p. 55), an understanding of human artifacts through interrogation to unveil causal factors. However,

the 'dense web' of meanings is influenced by the author's intention and the reception of the readers. As a philosophical movement, interpretation and comprehension are considered to be an important faculty of human 'being-in-the-world'. Considering humans as interpretive beings, hermeneutics developed various approaches to interpretation and understanding.

Classically, technology has never been of any interest to hermeneutics. However, the inevitability of technology in the transmission of meaning and mediation between human beings and reality necessitated the extension of the understanding of hermeneutics. Technologically facilitated I-world relations offer new interpretations and entrée to the world. Ihde (1990) recognises technologies as having a hermeneutic nature by emphasising their "magnification-reduction structure". Technologies do not merely replicate the real world but selectively recognise the world around us in its hermeneutic function. In this sense, technology offers a delegatory function (Latour, 1994) in being an interpretational agency to humans.

The primary challenge facing the Digital Humanities does not stem solely from their integration with the material world—a transformation that varies only in degree. Rather, the critical issue lies in the absence of robust methodological and critical frameworks that should ideally facilitate both the generation of meaning and the development of functional digital products. The central epistemological challenge for the Digital Humanities lies in their inherent entanglement with technology to such an extent that it necessitates prioritising the functionality of solutions about interpretation (Smithies, 2017, p. 7).

Digital hermeneutics has laid two trajectories: one follows *kunstlehre* for the analysis, understanding and interpretation of digital native texts, texts corpora or databases. Another trajectory deals with the acknowledgement of the identicalities and contrasts between human and AI intentionality. Computers and software generate ontological and technological differences in interpretational methods in humanities. Ontology, here, includes the veracity and the texture of the object of interrogation. It establishes the object of linguistics, the context out of which the text derives its sense. The text is fashioned into a specific corpus so as to be interpreted.

Digital hermeneutics can be understood as the interaction between hermeneutics and digital technology. We live in a society where communication and information networks are digitally founded. One of the major challenges for hermeneutics in the digital network era is the creative social relevance and interpretation of knowledge. The pseudocritical refutation of hermeneutics in the context of digital technology is of concern. To encounter the challenges offered by digital technology, we must evolve a "productive logic"¹ (Heidegger, 1996, p. 10) in deciphering the dynamics of digital technology and its relationship with human existence.

Modern technology not only covers over or obscures the thinghood in things, it also covers over or obscures the Being of beings, and ultimately itself. Technology cannot be understood in terms of technology (Mitcham, 1994, p. 53).

In Heideggerian ontology, Technology² emerges as the principal antagonist to the essence of Being. Therefore, it exerts a profound influence on our perception and engagement with technological artefacts, analagous to Being's comprehension of the manifold manifestations of existence. Technology engenders comparable implications for our understanding of the diverse array of technological entities. Within the framework of ontological hermeneutics, which eschews inherent valorisation, there exists a reflexive acceptance of the Truth-event.

Departing from the classical notion of *techné*, Heidegger contends that Technology serves to veil reality, thereby advancing an understanding of reality as primal matter readily available for utilisation and manipulation. The conceptual apparatus of Being introduces a veil that obscures the interpretation of the plurality inherent in beings, analogous to an obfuscating effect on the comprehension of the multiplicity of technologies and technological processes. The nexus between 'beingin-the-world' and hermeneutics accentuates the pivotal role played by tools in mediating the relationships between human agents and their environment.

Typically, human actors direct their cognitive focus not toward

¹ Heidegger's "productive logic" is an anticipation of the novelty of what is unveiled in the moment of discernment.

² Heidegger examines the question concerning Technology (with capital 'T') in relation to Being and Thing. Technology, Being and Thing, in his argument, are interrelated. Technology's relation with Being and Thing is arbitrary, ambiguous and it observes each other.

the instruments employed but rather toward tasks in which they are engaged. Tools act as mediators that obscure the direct connection between humans and the world, instead moulding the perceptual landscape through which the world manifests itself:

Things, in short, disclose the world. When somebody uses a tool or piece of equipment, a referential structure comes about in which the object produced, the material out of which it is made, the future user, the environment in which it has a place are related to each other (Verbeek, 2005, p. 79).

The significance of a tool typically emerges when it ceases to function as expected, drawing attention to its presence and necessitating a detailed examination of its structure. At this juncture, the materiality inherent to its functionality serves as a crucial intermediary in shaping the relationship between humans and the world. The transition of the tool from a state of seamless integration, known as 'ready-to-hand', to a state of conspicuous objectivity, underscores its pivotal role in mediating human-world interactions. Irrgang raises some pertinent questions:

How is it that human behaviours and embodiment affect the associated social and cultural factors? How do we relate technologies in the lifeworld? What kind of relationship stand in direct correlation to technologies? How does the lifeworld shape technology and, conversely, how does technology shape the life world?" (qtd. in Tripathi, 2016, p. 148).

The emphasis noted here is the pertinence of the relationship between the human experience of life-world and the interceding tools. Ihde (1990; 2006) discusses how human-technology relations facilitate and transform our experiences. These relations also pave the way for the generation of structural aspects of technological mediation fashioning varied possibilities of experiences. Technological mediation regulates the relations between human activities and devices. We should be aware that:

Technologies are not neutral instruments or intermediaries, but active mediators that help shape the relation between people and reality. This mediation has two directions: one pragmatic, concerning action, and the other hermeneutic, concerning interpretation (Verbeek, 2008, p. 94).

Language is a significant tool in the expression of "intelligibility

of being-in-the world" (Heidegger, 1996, p. 151). The utilisation of language, whether in interpersonal discourse or introspective reflection, facilitates authentic comprehension and engagement with the world. This underscores an inherent, albeit passive, ontological interdependency between Being and language. However, this dialogue often overlooks the materiality inherent to language. While convenience remains associated with linguistic expression, the notion of value is contingent upon the interconnectedness within linguistic systems, as elucidated by Saussure. Emphasising the significance of reference, Heidegger diverges from prioritising tools in favour of examining signs as integral components of interpretation and signification. Consequently, the relationship between Dasein and language assumes a nuanced trajectory, wherein the focus shifts towards the realm of signs to attain consciousness. The articulation of inner conscience finds expression through what can be termed as the 'mode of silence', thereby indicating a shift towards introspective contemplation. This interplay between conscience and silence epitomises a journey of self-awareness that serves to orient one towards a deeper understanding of reality.

Ricoeur's (1991) hermeneutics is founded on written and stable forms of language like symbols, signs and narratives. Emphasising the ontological prominence of writing, he maintains that:

The psychological and sociological priority of speech over writing is not in question. It may be asked, however, whether the late appearance of writing has not provoked a radical change in our relations to the very statements of our discourse (Ricoeur, 1991, p. 106).

In Ricoeur, we find the basis for the materiality of language and interpretational procedures. The semiotic and semantic interventions in the functioning of signs, symbols and narratives are external. However, concerning the transmission of meaning, Ricoeur is not concerned with either materiality or externalisation of language. The digital presence challenges Ricoeur's notion of narrative identity in terms of "mono-linearity and mono-ideality" (Romele, 2020, p. 7). Narratives that we hear or read have exploratory functions pushing language between explanation and instruction, through which our identities are configured. The texts we read are heterogeneous and they vary every time we read them. Digital texts are indefinite, it is a sequence and possibility of expression that anticipates the future. A story that took place in the past is expressed in the present and amplified towards the future like a video game. Moreover:

While stories are enclosed in an emplotment already decided by the author, computer games allow the player to move freely within a framework of few given rules. In some sense, computer games are the concrete realization of the speculations of postmodernity and the clumsy attempts of some literary avant-gardes (Romele, 2020, p. 7).

Information and meaning

The relationship between information and meaning is implicit and indispensable. Floridi's (2005) understanding of semantic information is an affirmative relationship between data, meaning and truth (data + meaning + truth). The interconnection between data and information is an evolving domain. The fundamental principles of analysis can be appropriated in the context of application. The non-cognitive, affirmative and embedded domain includes objects such as databases, encyclopaedias and websites. The challenges facing the materiality of production and its interdependence with information from its locus and interpretation anticipate semiotic code and its corporeal implementation. The standard definition of information (SDI) includes data, data configuration and meaning. The data concerning SDI cannot be 'dataless' as it is deciphered with relational entities. Concerning relationalities, Floridi (2005) assumes data as "definable as constraining affordances, exploitable by a system as input of adequate queries that correctly semanticise them to produce information as output" (p. 357).

Translation introduces the work of reconfiguration into the syntactic and semantic framework. The primal intentions allow a process of interpreting the signs. The evocative and familiar data qualify as information even when they represent or transfer a truth. Sometimes, misinformation can be informative because it can be reduced to a notion of "non-primary" information. Non-primary information is presented through instances without data and differential objects. Further:

A machine that always gives the same answer does not provide any information unless it stops responding, but the information it will give in this case (for example, the machine is broken) will be meta-information (Romele, 2020, p. 29).

Meaning and truth are embodied in information. The accentuation on uniformity and transmission of information communicates the preference over multiplicity. What lies underneath the theory of information is the relation of being and the relation within beings. Both these relations are distinct and individual, preserving the information to be communicated. The above-mentioned relations presume being/ information as having an intrinsic value. When it comes to reality, information innately renders its ethical choices. While data processing is desired, the presence of information creates a paradoxical circumstance in hermeneutic relations. Further:

Sometimes this understanding is merely in the background, as when a habitual user deals with the computer mouse, while at other times it is in the foreground when, for example, we have to confront new technological objects (Romele, 2020, p. 37).

Introna (1993) presents three different stances on information: a) information is the consequence of a process of transformation. Data is altered into information; b) significance of the receiver or user. The receiver should be familiar with the information he/she receives to make it meaningful; c) information aims to influence the choices of the receiver/receiving system. The condition on which data transform into information depends on how they become meaningful to the recipient. Hermeneutic relations set right the error that occurs in the process of communication. When a sender encodes his/her message to connect with the receiver, the sender anticipates the knowledge of the message in the receiver. The receiver is expected to interpret the message even when the signs or symbols are limited; an unrestricted series of meanings is expected. The relations between the symbols or signs and their meaning keep varying according to the context. Thus, a dialectic hermeneutic approach becomes fundamental within the information systems where the self-understanding of the sender and receiver contributes to the meaning-making process. This approach is based on the lived experience and how a message is appropriated in the lived experience. Given the context and perspective, interpretation within an information system is perpetual and never complete. Since data cannot be transmitted, interpretation becomes direct and contextual. Interpretation of a message also involves understanding the information. A sequence of knowledge system/s is involved in this process of understanding.³

³ See Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (1949).

Data and interpretation

The emerging digital constructs not only herald profound transformations at the individual level but also introduce unprecedented quantities of knowledge and information devoid of the regulatory mechanisms traditionally provided by philosophical underpinnings. Technology facilitates unrestricted access to vast reservoirs of human knowledge. The traditional figure of authority, epitomised by the professor who dictates what information to seek and prescribes structured arguments for and against, appears increasingly obsolete in the contemporary landscape. There is a burgeoning recognition of the necessity to incorporate the learning and application of computer code within educational frameworks, potentially engendering the emergence of a novel academic discipline centred on computation or data analysis. The intricacies inherent in code necessitate meticulous consideration at multiple levels. Beginning with the material engagement of users with code, encompassing both programmers and consumers, to the processes of reading and writing code, culminating in the execution and resultant experience of its functionality, it is imperative to foreground the comprehension of code as computational logic embedded within tangible technical devices (Berry, 2011, p. 63).

The advent of 'Big Data' has altered the interpretive processes and analysis of texts. This transition has underlined the significance of digitised textual corpora that are available for analysis. The presence and availability of digitised textual corpora have completely altered the manner of examining and interpreting the texts. These fundamental alterations are made in the way we use textual analytic methodologies to understand and gauge the meanings and character of textual corpora.

Digital hermeneutics involves text prospecting sensibilities. The available text-examining tools draw upon a specific theory of reading. The influence of Big Data is the extension of varied types of algorithmic and computational tools for interpreting texts. Technologies offer us the capability to deliberate a textual corpus in its hermeneutic intricacies and distinctions. The complexity of a textual corpus and how we excerpt different poetically significant elements or structurally entangled sequences provide interpretive intention to the corpus.

The focus is on various groupings of quantifiable textual features in

a text to interpret. Big Data offers us an extraordinary sum of datasets and opportunities to engage, analyse and interpret textual corpora. The effort requires the extraction of critical information through deeper content analysis to pursue subtler nuances of textual corpora. The communicative purpose of a text, in digital hermeneutics, assumes multiple, contrasting and overlapping meanings. While traditional close reading presupposes the sole meaning of a text, we can analyse and understand the textual corpora based on its style and how it is embedded in wider literary contexts and interlinks. Consequently, the style becomes the substance of the text.

'Data' is a catchword in the contemporary digital world. Similar to:

[...] industrial technologies of the past were accompanied by new social, cultural and political imaginaries, we can trace the ascent of 'data imaginaries' and 'data speak': visions and rhetoric concerning the role of data in society (Grey, 2018).

Data encompasses a variety of possibilities for the future and the relations that could appropriate practical tasks.⁴ The data world:

[...] draws on philosophical ideas about worlds, worlding, and worldmaking to look at how things are *sayable*, *knowable*, *intelligible* and *experiencable* through data (Grey, 2018).

The productive role of human thought is configured by the experience involving patterns, classifications and arrangements of space, time, causality and quantity. Hermeneutic thinkers like Heidegger and Gadamer challenged the Kantian emphasis on universal structures to highlight the importance of socially and historically positioned linguistic and cultural substructures in fashioning the worlds we exist. Language as a prospect of intelligibility offers conditions of possibility

^{4 &}quot;Companies see data as a lucrative new asset class and as a resource for streamlining their operations and for providing new offerings. Politicians see data as an instrument of reform by enabling transparency, accountability, participation and innovation. Journalists see data as a means to source stories and enrich their reportage. Activists see data as both an issue in itself and as a resource for intervention concerning everything from corporate and governmental surveillance to climate change and migration. Data is envisaged to make money, strengthen democracies, aid investigations and enable justice. At the same time, it has been subjected to numerous critiques. Data is also held to disrupt livelihoods, violate privacy, undermine democracies, deepen inequalities, distract from issues, and displace other forms of reasoning, sense-making and experience" (Grey, 2018).

for our experience considering the fundamental function. This position departed from the overemphasis on the information translation abilities of language.

The digital is deeply impacted by language because everything digital is deciphered into writing or is transcoded. The relevance of writing and its symbols are representative and performative. The translatability that exists between writing and the digital is decodable by human beings and transactable by machines. Information and communication systems have hybridised intellectual and material technologies.

The enunciation of expertise, communication of content and discussion about the transformation of matter are fundamental to writing and production systems. The physical patterns of information are made explicable through cybernetics. Expression and representation as techniques of manipulation are appropriated through informatics and algorithms. If the difference between signs and the technological is ontological, the material and technological understanding of the digital has hermeneutic underpinning.

Data worlding, as historically and culturally appropriated, is contingent on technologically influenced 'data a *priori*.' It not only defines but also offers various conditions of possibility of interpreting, understanding and engaging with different aspects of social life. The specific flair of interpretation and knowing various forms of experience are encircled within these conditions of possibility.

Consequently, data practices are to be understood as locating and innovatively contributing to meaning. Goodman (1978) reminds us that "worldmaking as we know it always starts from a world already on hand; the making is a remaking" (p. 6). The prospects of intelligibility offered by various modes of experiences and stances of reasoning are considered possible with the availability of data. Intelligibility also becomes possible with the presence of distinctive and emergent digital technologies. Therefore, the past and the present are involved in the making of possible meanings.

With the availability of digital data worlds:

[...] we may examine how composites of conventions, norms, technologies, practices, methods, pieces of software, graphical user interfaces, data standards, data formats and aesthetic approaches are implicated in making things up and making things intelligible with data.

This might include looking at how horizons of intelligibility change from pre-digital to digital data worlds (Grey, 2018).

Various forms of experience, reasoning and sociality ascend with the advent of cultural objects related to digital data worlds. The worldmaking opportunities and capabilities of things such as digital platforms, apps, software, code libraries and digital tools make sense of data and assimilate data into varieties of social procedures and systems.

Computer scientists employ quantitative methodologies and computational models to generate scientific evidence and to 'explain' or 'simulate' phenomena, while historians predominantly use qualitative and hermeneutic approaches to comprehend the intricacies of past events. Despite both fields using digital infrastructures, data, and tools, significant disparities persist in their epistemological and methodological underpinnings and the researchers' self-conceptions within these disciplinary communities.

Variances in research design and methodology, such as quantitative versus qualitative methods, and in the analytical approaches, exemplified by machine-driven "distant reading" versus individualised "close reading" of textual corpora, as well as differing aspirations-ranging from the pursuit of general scientific laws to the creation of unique subjective interpretations in the humanities-result in the emergence of complex "boundary objects" within our intellectual exchange zone (Fickers, Tatarinov & Heijden, 2022, p. 5). Computation is conceptualised as a strategy aimed at organising reality using logical and quantitative techniques (Fazi, 2018, p. 1). The systematic approaches employed in computation are commonly perceived as straightforward formulae designed to encapsulate the intricate dynamics and multifaceted nature of the world. From this vantage point, computation is construed as a process that simply acquires and portrays reality by employing binary calculations of probabilities. Following the interactive paradigm within computing, the deductive algorithmic processes must be supplemented by the unpredictable nature of environmental input to introduce the inherent unpredictability of the real-world context into the computational framework.

Furthermore, investigations into ubiquitous, pervasive, embedded, and physical computing underscore the imperative of imbuing computational processes with characteristics akin to empirical scenarios (Fazi, 2018, p. 3). In this vein, both the technical and cultural discourse surrounding situated computing endeavours to emphasise the mediated accessibility of computational devices within the context of tangible reality. This accessibility primarily manifests through the physical interaction between users and machines, thus necessitating a material or embodied engagement.

Interaction, therefore, evolves into a practice intertwined with the spatial orientation of computing devices within the physical environment and our interactional dynamics with them. The computational realm extends beyond the digital domain, encompassing a broader spectrum of operations, yet both are grounded in discrete processes involving counting, measurement, and quantification. This foundational discrete nature predates the formal instantiation of computation within finite-state machines such as computers. Nonetheless, this instantiation underscores the inherent alignment of principles: both the computational and the digital rely on the discretisation of reality.

The digital, functioning as a method of information processing, employs digits—such as the binary digits of zeros and ones—to represent and manage data. Similarly, within the computational sphere, discreteness is expressed through various quantifying mechanisms, including models, procedures, representations, symbols, numbers, measures, and formalisations. Whether engaged in digital or non-digital computation, the act involves organising reality into abstracted relations among these quantifiable entities. Both the entities themselves and the relations between them can be subject to logical manipulation, resulting in an output corresponding to a given input.

Consequently, computing transcends mere numerical computation; a computing machine serves as a 'meta-medium,' capable of representing numerous other media while augmenting them with novel properties. These achievements hinge upon the fundamental discretising nature of computation. A computer possesses the capability to execute any task that can be articulated in finite, well-defined terms through a sequential series of executable instructions (Fazi, 2018, p. 48).

Hermeneutic relations

Ihde's philosophy of technology, predicated upon the framework of the Husserlian model of intentionality, underscores an emphasis on cultivating a phenomenology of human-technology relations. In this perspective, the experiential interface between humanity and technology assumes a paramount significance. The nature of what is experienced becomes inextricably intertwined with the modalities through which it is experienced. Inde maintains that "there have been technological revolutions in imaging technologies which created the ways for material things to 'speak' and more, thus leading to a 'material hermeneutic' which will change all previous histories and interpretations." (2020, p. 35–36). Inde postulates that the nexus between humans and technology, like other interpersonal relations, unfolds within the expansive domains of consciousness and intentionality, thereby accentuating the intricate interplay of subjective awareness and purposive engagement. Within this framework is the recognition that the human-technology dyad is not merely a uni-dimensional interaction but rather a multifaceted fabric of experiential encounters. Such encounters are intricately woven into a technologically saturated culture.

Ihde's proposition accords primacy to the lived experience of technology, contending that it is through the prism of experiential recognition that the profound implications of technological mediation upon human existence can be apprehended (2022, p. 112). While Ihde's stance offers valuable insights into the subjective dimensions of human-technology relations, it arguably elides certain structural and systemic dynamics that underpin the contemporary technological landscape. By foregrounding individual experience, Ihde risks eliding broader sociopolitical forces that shape and constrain the contours of technological engagement, thereby potentially occluding critical inquiry into issues of power, inequality, and technological determinism. While the emphasis on intentionality foregrounds the active agency of human subjects in shaping their technological milieu, it may inadvertently obscure the myriad ways in which technology itself exerts a formative influence on human consciousness and behaviour.

Inde, in his presentation of "hermeneutic relations," recognises the symbiotic interplay between human agency and technological mediation.

The experience of technology assumes an ontological dimension similar to that of an "other self-like" entity. Central to this schema is the notion of engaging in a "special interpretive action within the technological context," (1990, p. 40) where human actions and observations are imbued with interpretive significance, engendering a dialectical process of meaning-making through reading. For instance:

The engineer in the case "reads" his dials and if one creeps up, indicating that Quad X is overheating, he merely has to turn a dial and watch to see if the heat begins to turn to normal. If it does, all right, if not, he may have to call a building manager to find out what has broken. Here the engineer is engaged in experiences *of* a machine (Ihde, 1990. p. 41).

The engineer engages in a form of interpretive engagement with the instrumental panel of the machine, wherein the dials and indicators serve as mediators through which the engineer grasps the machine's state and functionality. This interpretive act, characterised by a reflexive interplay between observation and action, epitomises the essence of hermeneutic relations. The technological artefact assumes a quasi-autonomous agency, necessitating a reciprocal engagement on the part of the human subject.

Of particular importance is Ihde's elucidation of the contingent nature of hermeneutic relations, wherein the efficacy of interpretive action is contingent upon the allegiance of the technological artifact as a mediator of meaning. The engineer's ability to discern the operational status of the machine hinges upon the fidelity of the instrumental panel as a faithful representation of the machine's underlying state. Therefore, the hermeneutic relation is predicated upon a delicate equilibrium between the interpretive prowess of the human subject and the fidelity of the technological artifact as a mediator of meaning.

Reading technology as a means of accessing knowledge about the 'world' transcends the conventional purview of existential inquiry to explicate the interpretive relations that underpin the interface between humans and technology within the fabric of our lived reality. Inde urges us to see the scientific objects "which are techno constructed to be 'seen-read' though the specific style of interpretation which is a scientific hermeneutic" (Inde, 1997, p. 123). At the heart of Inde's exposition lies the recognition that technological artifacts serve as mediators through which human subjects access and interpret the underlying realities of

their environment. Inde highlights how technological objects, despite their material instantiation, transcend their immediate physicality to signify something beyond themselves.

You read the thermometer, and in the immediacy of your reading you *hermeneutically* know that it is cold [...] but you should not fail to note that perceptually what you have seen is the dial and the numbers, the thermometer "text". And that text has hermeneutically delivered its "world" reference, the cold (2006, p. 42).

When one reads a thermometer, for instance, the perceptual encounter with its dial and numerical display serves as a hermeneutic engagement through which the ambient temperature, or the 'world' reference, is understood.

Thus, the act of reading technology becomes synonymous with deciphering the textual cues embedded within its material form and thereby facilitating a deeper understanding of the surrounding reality. Ihde explains the concept of "technological otherness," wherein the technological artifact assumes a quasi-autonomous agency that stands in contrast to the frailty of human existence. This acknowledgment of the ontological disparity between human subjects and technological objects underscores the asymmetrical power dynamics inherent within human-technology relations. Technological otherness, therefore, not only amplifies the potency of technological artifacts as mediators of knowledge but also underscores the inherent vulnerability of human subjects vis-à-vis the formidable capabilities of technology. The invocation of technological otherness raises pertinent questions regarding the ethical implications of ceding agency to technological artifacts and the concomitant erosion of human autonomy.

The discourse on digital hermeneutics unveils an examination of the interpretive processes within the technological milieu, foregrounding the intricate interplay between reading, writing, and the material instantiation of language. Reading involves technologies and writing has a 'product'. Writing is recognised as a technologically encapsulated form of language (Ihde, 1990, p. 81) where the act of inscription mediates the perception and transmission of meaning. This technologically mediated aspect of writing engenders a transformative dynamic, whereby our understanding of language and meaning undergoes a perceptible shift.

The representational isomorphism between text and the corporeal

space of perception sheds light on the nuanced interrelationship between technology, perception, and cognition. The correlation between text and vision constitutes a "representational isomorphism with the natural features of the landscape" (Ihde, 1990, p. 81) that underscores the profound influence of technological mediation on our perceptual experiences. This differentiation between representational and perceptual isomorphism introduces a crucial distinction that warrants closer scrutiny. The difference is visceral, where technology influences the textual artefact. Technologies as artefacts become virtually any material entity that can be engaged in praxis.

This aligns with the assimilation of the artifact into a human-directed or referential praxis vis-à-vis the external world. This is exemplified by the elementary act of retrieving a stone and propelling it. However, in the majority of cases, humans tend to enact some form of rudimentary technical adaptation to the artifact before its utilisation (Ihde, 1998, p. 46). When the representational isomorphism vanishes from a text, there are no demonstrative references other than a technologically encapsulated form of language. The perceptual object concurrently corresponds to the demonstrative references. The technologically embodied sensitivities are different in the printed text based on the referential clarity. Ihde observes: "Textual transparency is hermeneutic transparency, not perceptual transparency" (1990, p. 82).

The assertion that textual transparency equates to hermeneutic transparency rather than perceptual transparency emphasises the differential processes at play in the interpretation of technologically mediated artifacts. While the representational isomorphism between text and vision may facilitate a certain level of interpretive clarity, it remains imperative to interrogate the extent to which this clarity is contingent upon technological mediation. Textual transparency is achieved through hermeneutic procedures rather than perceptual immediacy, which prompts critical reflection on the epistemological implications of technological mediation in shaping our understanding of language and meaning.

Inde's observation regarding the developmental trajectory of writing and its divergence from oral speech underscores the intricate historical and socio-cultural dynamics that corroborate the evolution of language and communication. The advent of digital technologies has precipitated a paradigm shift in the dissemination and reception of textual artifacts, necessitating a re-evaluation of traditional conceptions of writing and interpretation.

Writing can be assessed, deciphered and interpreted in terms of its linguistic transparency. Therefore, writing becomes an "embodied hermeneutic technics" (Ihde, 1990, p. 84). The role of writing as a technologically mediated form of communication is where the transparency of linguistic expression shapes the perceptual landscape of the textual domain. The notion that writing fashions the world of the text through its capacity for linguistic transparency illuminates the intricate interrelationship between language, meaning, and the experiential structures engendered by technological mediation.

Inde navigates the complex terrain of human-technology relations within the framework of hermeneutics, elucidating how the mobility from embodiment associations to hermeneutic relations is contingent upon the interplay between human subjects and technological artifacts. The enigmatic nature of this connection, particularly exemplified in his illustration of the control panel as an intermediary between the observer and the referent object, underscores the fluidity and complexity of technological mediation within the perceptual realm (Ihde, 1990, p. 84).

The formulation of the *I*-(technology-world) (Ihde, 1990, p. 86) relation emphasises the continuity and interdependence between human subjects, technology, and the world they inhabit. The everaltering human-technology relations pose challenges to hermeneutic relations. The position of technicity in hermeneutic relations depends on the intermediary between the instrument and the referent. Perceptually, the user's visual position depends on technology. Therefore, "To read an instrument is an analogue to reading a text. But if the text does not correctly refer, its reference object or its world cannot be present" (Ihde, 1990, p. 87).

The interpretive act of reading instruments parallels the reading of texts, and underscores the significance of technological artifacts as mediators of meaning and understanding. However, there exists the potential limitations and ambiguities inherent within technological mediation, particularly in instances where the referential clarity of the text or instrument is compromised. Without placing the humantechnology relations on the hind side of the hermeneutic relations, Ihde deliberates on the various positions from which the perceptual and the human-technology interact. When technology functions, the technology-world relation maintains its hermeneutic transparency. However, the I-(technology-world) relation is a continuity signifying the relation as a hermeneutic meeting of perceptual relations with technology variations. Interpretive technologies allow the extension of hermeneutic and linguistic possibilities through machines, while reading maintains the perceptual position in relation to the technology. The transformation collectively guides us toward the differences between text and interpretation/meaning:

The transformation made possible by the hermeneutic relation is a transformation that occurs precisely through *differences* between the text and what is referred to. What is needed is a particular set of textually clear perceptions that 'reduce' to that which is immediately readable (Ihde, 1990, p. 88).

Interpretive technologies as facilitators of linguistic and hermeneutic possibilities through machines punctuate the transformative potential of technological mediation in expanding the horizons of human understanding. The argument that hermeneutic transformation occurs through the differences between the text and its referent invites scrutiny regarding the epistemological foundations of interpretation, and the extent to which technological mediation shapes our understanding of reality.

Hermeneutic relations involving technologies explore the intricate dynamics between perception, interpretation, and technological mediation. The vertical modifications within hermeneutic relations accentuate the transformative potential inherent in the act of reading the world as a readable text. The plasticity within hermeneutic relations is contingent upon the linguistic constructs employed, highlighting the malleability of meaning within interpretive frameworks. The conceptualisation of digital protocols as facilitating the translation and retranslation of perceptual phenomena into analogues of writing represents a significant advancement in understanding the role of technology in mediating human experience. These translation processes as transformations from perceptual gestalt to transmittable codes underscore the transformative power of technological mediation in shaping the perceptual landscape (Ihde, 1990, p. 93).

The mobility from embodied relations to hermeneutic relations transpires from the human-technology continuum. These relations are convoluted as the differences are emphasised through embodied and perceptual inconsistencies. The relation between perception and interpretation is tangled. Perception is interpretational because the process of perception and perceptual relations can be supposed as reading, which involves decoding and interpreting. Nevertheless, specialised technics are involved in the process of reading, making it a specific act. The perceptual position alters in embodiment relations and hermeneutic relations encompassing various interpretive actions.

Hermeneutic transparency is imperceptibly altered through perceptual transparency. Reading with a specific point of reference is not essential to generate a perceptual object. Therefore, the praxis surrounding the perceptual relations accomplishes immediate interpretive examination. Hermeneutic transparency does not incline towards the interpretive affirmations that evolve out of a text. It maintains the extemporaneity through corporeal mobility. In embodiment relations and hermeneutic relations, technology does not attempt to accomplish objectiveness. It remains without any alteration. Nonetheless: "When the technology in embodiment position breaks down or when the instrumentation in hermeneutic position fails, what remains is an obtruding and thus negatively derived object" (Ihde, 1990, p. 94).

While Ihde adeptly navigates the complexities of the humantechnology continuum, the assertion that embodied and hermeneutic relations encompass various interpretive actions raises questions regarding the ontological status of these relations. The tangled relationship between perception and interpretation underscores the epistemological challenges inherent in discerning the boundaries between these modes of engagement. Moreover, Ihde's delineation of hermeneutic transparency and its imperceptible alteration through perceptual transparency invites scrutiny regarding the ontological status of technological mediation within interpretive frameworks. That technology remains without alteration in embodiment and hermeneutic relations raises questions regarding the extent to which technological artifacts influence and shape human perception and interpretation. The negative implications of technological breakdowns in embodiment and hermeneutic positions prompt reflection on the fragility of humantechnology relations and the potential disruptions to perceptual and interpretive frameworks.

The embodiment relations and hermeneutic relations are differentiated by the existential association between humans and the world. Interpretive strategies and signification processes also are distinguished in these relations. Technology could influence the existential aspects of interpretation because the practical context remains in a state of transition. When technologically inclined praxis is controlled, the referential focus is constrained.

In the progress of technologies, enhancement of instrumentality and materiality advances. The existential sense of embodiment relations is not constrained by isomorphism because hermeneutic variations establish themselves.⁵ Within embodiment relations and hermeneutic relations, technology intervenes to facilitate the perceptual and existential association with the world. The technology's materiality, therefore, would vanish. An affirmative materiality emerging from instrumental technologies encompasses the hermeneutic relations. "The bodily-perceptual focus *upon* the instrumental text is a condition of its own peculiar hermeneutic transparency" (Ihde, 1990, p. 97).

Ihde's nuanced differentiation between embodiment relations and hermeneutic relations within the context of human-technology interactions underscores the multifaceted nature of interpretive strategies and signification processes. His elucidation of how technology influences the existential aspects of interpretation amidst a landscape of perpetual transition is both insightful and pertinent. However, critical scrutiny reveals certain conceptual ambiguities and tensions within Ihde's framework.

While Ihde highlights the transformative potential of technology in shaping the existential associations between humans and the world, his characterisation of technological intervention as facilitating perceptual and existential engagement warrants closer examination.

⁵ Citing the relation between music and technology, Ihde writes: "computer-produced music clearly occurs much more fully within the range of hermeneutic relations, in some cases with the emergence of random-sound generation very close to the sense of otherness, which will characterize the next set of relations where the technology emerges as other" (1990, p. 96).

That the materiality of technology vanishes within embodiment and hermeneutic relations raises questions regarding the extent to which technological artifacts influence and shape human perception and existential understanding.

Inde's depiction of an affirmative materiality emerging from instrumental technologies within hermeneutic relations presents a somewhat deterministic view of technological mediation. The proposition that the bodily-perceptual focus upon instrumental text constitutes its peculiar hermeneutic transparency overlooks the complex interplay between technological artifacts and human agency in shaping interpretive frameworks.

The proposition that hermeneutic variations establish themselves within embodiment and hermeneutic relations implies a deterministic view of technological mediation, wherein the influence of technology on interpretive strategies is portrayed as a foregone conclusion. However, a critical examination reveals that human agency, and socio-cultural factors also play a significant role in shaping the interpretive landscape.

Digital technologies are hermeneutic technologies encompassing hermeneutic relations as they can curtail the distance between the world and its representations (interpretations). Digital technologies can bridge the gap between the text and its interpretive process. The materiality of digital technologies explores the information to communicate it to the hermeneutic self. The connection between the materiality of digital technologies and information is a social actuality anticipating digital traceability. Reality is digitalised through symbols and signs making sense and meaning to the hermeneutic self. Digital traceability is independent of sense and meaning. They are defined autonomously from each other without any specific signification. The nature of the interpretation of signs, in digital traceability, is mechanical and material. It is a challenging venture:

A difficult exercise for us human beings, who are above all semiotic animals that approach what surrounds us by its significance, as a message that we must interpret since the world is not merely reduced to what is shown here and now (Bachimont qtd. in Romele, 2020, p. 23).

Digital technologies accentuate "a process of symbolic distanciation from the world and it is only on this basis that they appropriate the entire world and become effective into it" (Romele, 2020, p. 21). It is within the subtleties of distanciation and appropriation of digital traceability, Romele locates digital hermeneutics. The

[...] digital is structurally based on a performative distanciation from the world that the digital cannot realize its aspiration of being the world, but rather continues to need the world as its interlocutor and as its "otherness" (Romele, 2020, p. 21).

Hermeneutic relations between division and appropriation locate a space in digital traceability. Ricoeur inclines towards "fusion of horizons" to balance the appropriation of approaches involving interpretation (Romele, 2020, p. 20). The interaction between the object and the text, and the intention of the author and the reader are connected through various approaches to appropriating texts.

With the development and ubiquitous presence of 'technoscience', the interpretive activity has gained further momentum. Digital hermeneutics inclines heavily on materiality offering new possibilities of how we read and interpret the text. The relationship between human beings and the computer is a system that offers mind to the machine. It is a connection between digital information and human perception. The materialist nature of phenomenology and technology assumes that the juxtaposition of human corporeality with artificial instantiation serves to catalyse the evolution of hermeneutical discourse. Artificial intelligence serves as the nexus through which human cognition and computational prowess converge via a corporeal conduit.

The automaton, bereft of corporeal form, lacks the perceptual and kinesthetic faculties inherent to organic embodiment. Notwithstanding, a demarcation persists between electronic and corporeal vessels, yet the automaton proffers an expanded hermeneutic paradigm, thus enhancing its function within the interpretative praxis. The ensuing perceptual phenomenon engenders a process characterised by its amalgamation of scientific rigor with hermeneutic inquiry. The instrument extends itself as a human embodiment by becoming 'virtually transparent' in the interpretive activity. Thinking happens differently for a computer or thinking never happens. It is only through an illusion that human resemblance is assumed in a computer.

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