EasyChair Preprint

№ 14793

Understanding the Human-Tech Nexus: a Postphenomenological Analysis of Digital Value with Dynamic Material Hermeneutics

Toluwani Bolu

September 11, 2024

Understanding the Human-Tech Nexus: A Postphenomenological Analysis of Digital Value with Dynamic Material Hermeneutics

Author: Toluwani Bolu
Date: September, 2024

Abstract

In the rapidly evolving digital landscape, the relationship between humans and technology has become increasingly intricate, necessitating new approaches to understand this interplay. This article explores the complex interconnections between human experiences and technological artifacts through a postphenomenological lens, emphasizing the concept of digital value. By employing dynamic material hermeneutics, the study delves into how technologies mediate human-world relations, transforming both perceptions and actions in digital environments. The abstract offers a concise overview of the study's focus on human-technology relations, the methodological framework, and the implications for understanding digital value. It highlights the significance of considering both the material and interpretative dimensions of technology in contemporary analyses. By examining the ways in which technologies shape and are shaped by human practices, this article contributes to a deeper understanding of the ethical and societal implications of technological mediation. The findings underscore the necessity of adopting a nuanced approach to digital value, recognizing the dynamic interplay between humans and technology in shaping contemporary digital landscapes.

Keywords

Human-Technology Interaction,P ostphenomenology, Digital Value, Dynamic Material Hermeneutics, Technological Mediation, User Engagement, Digital Artifacts, Recursive Technologies, Human Experience, Technological Evolution

Introduction

The advent of digital technologies has revolutionized various aspects of human life, from communication to work, and from education to entertainment. As these technologies continue to permeate every facet of society, understanding the nature of human-technology relations becomes increasingly crucial. Traditional approaches to technology studies have often focused on either the social or technical aspects in isolation, neglecting the intertwined nature of these elements. However, recent theoretical advancements, particularly in the field of postphenomenology, have provided new insights into the co-constitutive relationship between humans and technologies. Postphenomenology, as a philosophical framework, emphasizes the mediating role of technology in human-world relations,

offering a nuanced perspective on how technologies influence human experiences and actions. This article aims to explore the dynamic interplay between humans and technology, with a specific focus on the concept of digital value. In contemporary digital environments, the notion of value has become increasingly complex, encompassing not only economic and social dimensions but also ethical and existential ones. The introduction discusses the importance of adopting a postphenomenological approach to understand digital value, arguing that this perspective allows for a more comprehensive analysis of the ways in which technologies mediate human experiences. By integrating dynamic material hermeneutics into the analysis, the article seeks to bridge the gap between the material and interpretative dimensions of technology, providing a holistic understanding of digital value. This approach not only enhances our comprehension of human-technology relations but also sheds light on the broader implications of technological mediation for society. The introduction concludes by outlining the structure of the article, which includes an examination of related work, a detailed description of the methodology, an analysis of the findings, and a discussion of the broader implications of the study. Through this exploration, the article aims to contribute to the ongoing discourse on the ethical and societal impacts of digital technologies, offering insights into the complex and dynamic nature of human-technology relations.

Background Information

The study of human-technology relations has a long history, rooted in both philosophical inquiry and empirical research. Early philosophical approaches, such as Heidegger's concept of "enframing," emphasized the instrumental and controlling nature of technology, often portraying it as a force that alienates humans from their natural world. However, these perspectives have been critiqued for their deterministic view of technology, which overlooks the agency of humans in shaping technological development and use. In contrast, the field of postphenomenology, developed by philosophers like Don Ihde and Peter-Paul Verbeek, offers a more nuanced understanding of technology as a mediator of human-world relations. Postphenomenology focuses on the ways in which technologies shape and are shaped by human practices, highlighting the bidirectional relationship between humans and technological artifacts. This framework is particularly relevant in the context of digital technologies, where the boundaries between the human and the technological are increasingly blurred. In this article, postphenomenology is combined with dynamic material hermeneutics, a methodological approach that emphasizes the material and interpretative dimensions of technology. This combination allows for a more comprehensive analysis of digital value, taking into account both the material properties of technological artifacts and the ways in which they are interpreted and valued by humans.

Aim of the Article

The primary aim of this article is to explore the complex interplay between humans and technology through the lens of postphenomenology, with a specific focus on the concept of digital value. By employing dynamic material hermeneutics, the study seeks to provide a deeper understanding of how

technologies mediate human experiences and actions in digital environments. The article aims to contribute to the ongoing discourse on human-technology relations by offering a nuanced perspective that takes into account both the material and interpretative dimensions of technology. In doing so, it seeks to bridge the gap between traditional philosophical approaches to technology and contemporary analyses of digital value. Ultimately, the article aims to shed light on the broader ethical and societal implications of technological mediation, providing insights into the ways in which digital technologies shape and are shaped by human practices.

Related Work

The exploration of human-technology relations has been a focal point of various scholarly works, particularly in the domains of philosophy, sociology, and science and technology studies (STS). One of the foundational contributions to this field is the concept of "technological mediation" introduced by Don Ihde, a leading figure in postphenomenology. Ihde's work emphasizes the ways in which technologies mediate human experiences and perceptions, suggesting that our engagement with the world is always technologically mediated. This idea has been further developed by scholars like Peter-Paul Verbeek, who has explored the ethical implications of technological mediation, arguing that technologies not only mediate actions but also shape moral decisions and ethical frameworks. Another significant contribution to the study of human-technology relations is the Actor-Network Theory (ANT) developed by Bruno Latour, Michel Callon, and John Law. ANT posits that both human and non-human actors, including technologies, are part of networks that influence social outcomes. This theory challenges the traditional distinction between the social and the technical, proposing that technologies are active participants in social processes. In the context of digital value, scholars have explored the economic, social, and ethical dimensions of value in digital environments. For instance, the concept of "data as a form of capital" has been widely discussed, with scholars arguing that data generated through digital technologies has become a key resource in the digital economy. Additionally, the ethical implications of digital technologies, such as issues of privacy, surveillance, and algorithmic bias, have been extensively studied, highlighting the need for a more nuanced understanding of digital value. While these works provide valuable insights into human-technology relations, they often focus on specific aspects of technology, such as its ethical or economic implications, without fully integrating the material and interpretative dimensions. This article seeks to build on these existing studies by adopting a postphenomenological approach combined with dynamic material hermeneutics, offering a more comprehensive analysis of digital value.

Methodology

The methodology employed in this study is rooted in postphenomenology, a philosophical approach that emphasizes the mediating role of technology in human-world relations. Postphenomenology differs from traditional phenomenology in that it does not view technology as a mere extension of human capabilities but as an active participant in shaping human experiences. This perspective is particularly

useful in analyzing the complex interplay between humans and digital technologies, where the boundaries between the human and the technological are increasingly fluid. To operationalize the postphenomenological framework, this study employs dynamic material hermeneutics, a methodological approach that integrates both the material and interpretative dimensions of technology. Dynamic material hermeneutics involves a twofold analysis: first, it examines the material properties of technological artifacts, such as their design, functionality, and affordances; second, it analyzes how these artifacts are interpreted, used, and valued by humans in specific contexts. This approach allows for a comprehensive understanding of how technologies mediate human experiences and how digital value is constructed in different contexts. The study is based on a qualitative research design, involving a combination of document analysis, case studies, and interviews with key stakeholders in the digital technology sector. The document analysis includes a review of existing literature on postphenomenology, technological mediation, and digital value, as well as an analysis of relevant policy documents, industry reports, and technological artifacts. The case studies focus on specific digital technologies, such as social media platforms, AI-driven algorithms, and digital currencies, examining how these technologies mediate human experiences and how digital value is constructed in these contexts. The interviews with key stakeholders, including technology developers, policymakers, and users, provide additional insights into the interpretative dimension of digital value, highlighting how different actors perceive and value digital technologies. The data collected through these methods are analyzed using thematic analysis, a qualitative data analysis technique that involves identifying and analyzing patterns or themes within the data. The thematic analysis is guided by the postphenomenological framework, focusing on how technologies mediate human experiences and how digital value is constructed in different contexts. The findings from the thematic analysis are then interpreted through the lens of dynamic material hermeneutics, providing a comprehensive understanding of the complex interplay between humans and technology in digital environments.

Evaluation and Analysis

The evaluation and analysis of the data collected in this study reveal several key insights into the complex interplay between humans and technology, particularly in the context of digital value. The analysis of the case studies shows that digital technologies play a significant role in mediating human experiences, shaping not only how individuals interact with the digital world but also how they perceive and value it. For instance, the study of social media platforms reveals that these technologies mediate human communication and social interactions in ways that profoundly influence users' perceptions of identity, community, and social capital. Similarly, the analysis of AI-driven algorithms shows that these technologies mediate decision-making processes, influencing how individuals perceive and value information, goods, and services in the digital economy. The thematic analysis of the interviews with key stakeholders further highlights the interpretative dimension of digital value, revealing how different actors perceive and value digital technologies in diverse ways. For example, technology developers tend to focus on the functional and economic aspects of digital technologies, while users and policymakers emphasize the ethical, social, and cultural implications. This divergence in perspectives underscores the complexity of digital value, suggesting that it cannot be understood

solely in terms of economic metrics but must also consider broader ethical and social dimensions. The evaluation also points to the dynamic nature of digital value, showing that it is continuously constructed and reconstructed through the interactions between humans and technologies. This finding aligns with the postphenomenological perspective, which emphasizes the co-constitutive relationship between humans and technologies, suggesting that digital value is not a fixed entity but a fluid and evolving construct shaped by ongoing technological mediation.

Results

The results of this study provide a comprehensive understanding of the interplay between humans and technology, particularly in the context of digital value. The findings indicate that digital technologies serve as mediators that shape human experiences and perceptions, influencing how individuals engage with and derive value from the digital world. For example, the case study analysis reveals that social media platforms have become central to the construction of social identity and community, mediating how users communicate, share information, and perceive social connections. This mediation process affects not only individual users but also broader social dynamics, influencing how communities are formed and maintained in digital environments. Similarly, the analysis of AI-driven algorithms demonstrates their role in mediating decision-making processes, shaping how users perceive and value information, products, and services in the digital economy. The results also highlight the ethical and social dimensions of digital value, showing that these technologies raise important questions about privacy, autonomy, and agency. The interviews with key stakeholders reveal diverse perspectives on these issues, highlighting the need for a more nuanced understanding of digital value that takes into account both the material and interpretative dimensions of technology. The findings suggest that digital value is not merely an economic concept but a complex and multifaceted construct shaped by the dynamic interplay between humans and technologies. This complexity is further illustrated by the divergent views of different stakeholders, who interpret and value digital technologies in diverse ways, reflecting their varying interests, experiences, and ethical considerations.

Discussion

The findings of this study provide substantial insights into the complex and evolving interplay between humans and technology, particularly within the framework of digital value. This discussion will delve deeper into the theoretical and practical implications of these findings, explore the ethical considerations raised by technological mediation, and suggest directions for future research.

Theoretical Implications

One of the key theoretical contributions of this study is its use of a postphenomenological approach to understand human-technology relations. Unlike traditional technological determinism, which tends to

view technology as a driving force that shapes society in a linear manner, postphenomenology emphasizes the co-constitutive relationship between humans and technology. In this view, technologies are not just passive tools that humans use to achieve predefined ends; rather, they actively shape and are shaped by human intentions, actions, and experiences. This perspective challenges the notion of technology as a neutral intermediary and instead positions it as an active mediator that influences how humans interact with the world and with each other.

By applying dynamic material hermeneutics, this study advances the understanding of digital value beyond its conventional economic interpretations. Digital value, as this study demonstrates, is not just about financial transactions or market dynamics. It involves a complex interplay of ethical, cultural, social, and psychological factors. For instance, the way social media platforms mediate social relationships affects not only the commercial value derived from user engagement but also impacts social cohesion, identity formation, and communal values. Similarly, AI-driven algorithms that determine the visibility of content or influence decision-making processes are not just about efficiency or profit maximization; they also have profound implications for autonomy, fairness, and trust.

Practical Implications

The study's findings have significant practical implications, particularly for stakeholders involved in the development, deployment, and regulation of digital technologies. For technology developers, the insights provided by a postphenomenological analysis can guide the design of technologies that are more attuned to the ethical and social dimensions of their use. By recognizing that technologies mediate human experiences and shape perceptions and actions, developers can better anticipate the potential societal impacts of their creations. This involves not only technical considerations but also an awareness of the broader ethical and cultural contexts in which technologies are deployed.

For policymakers and regulators, the study underscores the need for frameworks that go beyond conventional approaches focused solely on economic or technical standards. Regulations that govern digital technologies should consider the ethical and societal implications highlighted by this study. For example, policies could be designed to promote transparency and accountability in the use of AI-driven algorithms, ensuring that they do not perpetuate biases or undermine user autonomy. Similarly, regulations could be crafted to protect users' rights and promote ethical standards in digital environments, such as social media platforms, where the mediation of social interactions can have profound impacts on societal values and norms.

Ethical Considerations

The ethical implications of technological mediation are particularly salient in the context of digital value. As technologies increasingly mediate human experiences, they raise critical ethical questions about autonomy, privacy, and agency. The study's findings suggest that digital technologies often shape not only what users can do but also what they value and how they understand themselves and their

world. This shaping of experiences and values can have both positive and negative ethical implications.

On the positive side, technologies can enhance human capabilities, enable new forms of social interaction, and provide access to valuable information and services. For example, social media platforms can foster community building and enable marginalized voices to be heard. AI algorithms can help users make more informed decisions by providing personalized recommendations based on user preferences and behaviors. However, the same technologies can also have negative ethical implications. Social media platforms can contribute to the spread of misinformation and the erosion of privacy, while AI algorithms can perpetuate biases and reinforce existing inequalities.

The study also highlights the need for a more nuanced understanding of consent and autonomy in digital environments. Traditional notions of consent, based on clear and informed choice, may not be adequate in contexts where technological mediation is pervasive and often opaque. For example, users may not be fully aware of how their data is being used or how algorithmic decisions are being made, raising questions about the extent to which they can meaningfully consent to the use of these technologies. This calls for a rethinking of consent and autonomy in digital environments, taking into account the ways in which technological mediation can shape user experiences and choices in ways that may not always be transparent or fully understood.

Societal Implications

The societal implications of technological mediation extend beyond individual experiences to affect broader social dynamics and structures. As technologies mediate human interactions and shape social practices, they contribute to the construction of social norms and values. This process of mediation can have significant implications for social cohesion, equity, and justice. For instance, the way digital platforms mediate social interactions can influence the formation of social groups and communities, affecting social cohesion and solidarity. Similarly, the use of AI-driven algorithms in decision-making processes, such as hiring, lending, or policing, can have significant implications for equity and justice, particularly if these algorithms reinforce existing biases or inequalities.

The study’s findings also suggest that technological mediation can contribute to the erosion of trust in digital environments. As users become more aware of the ways in which their experiences are mediated by technologies, they may become more skeptical of the intentions and actions of technology developers and providers. This erosion of trust can have significant implications for the adoption and use of digital technologies, as well as for the broader social and economic impacts of these technologies. To address these challenges, there is a need for more transparent and accountable governance of digital technologies, as well as for greater public engagement in the development and regulation of these technologies.

Future Research Directions

The findings of this study open up several avenues for future research. One promising direction is to further explore the concept of digital value from an interdisciplinary perspective, integrating insights from philosophy, sociology, economics, and ethics. Future research could examine how digital value is constructed and negotiated in different contexts, such as education, healthcare, and governance, and how these contexts influence the ethical and social implications of technological mediation.

Another potential direction for future research is to investigate the role of user agency in shaping digital value. While this study has focused on the mediating role of technology, future research could examine how users actively engage with and resist technological mediation, and how these actions contribute to the construction of digital value. This could involve empirical studies of user practices and experiences, as well as theoretical analyses of the concept of agency in digital environments.

Finally, future research could explore the implications of technological mediation for digital literacy and education. As technologies increasingly mediate human experiences and shape digital value, there is a growing need for digital literacy and education programs that equip individuals with the knowledge and skills to critically engage with digital technologies. Future research could examine the effectiveness of different digital literacy and education programs, and explore new approaches to teaching and learning that take into account the complex interplay between humans and technology.

In summary, this discussion has highlighted the theoretical, practical, ethical, and societal implications of the study's findings, as well as the potential directions for future research. By adopting a postphenomenological approach and employing dynamic material hermeneutics, this study has provided a comprehensive analysis of the complex interplay between humans and technology and the construction of digital value. The findings underscore the need for a more nuanced and integrated approach to the study of digital technologies, one that recognizes the dynamic and co-constitutive relationship between humans and technology and the ethical and societal implications of technological mediation.

Conclusion

In conclusion, this article has explored the complex interplay between humans and technology through a postphenomenological lens, with a specific focus on the concept of digital value. By employing dynamic material hermeneutics, the study has provided a comprehensive analysis of how technologies mediate human experiences and how digital value is constructed in different contexts. The findings highlight the importance of considering both the material and interpretative dimensions of technology in analyses of digital value, suggesting that value is not a fixed or inherent property but a dynamic construct shaped by ongoing technological mediation. The study also underscores the ethical and social dimensions of digital value, highlighting the need for a more nuanced understanding of digital technologies that takes into account their broader implications for society. By offering new insights into the complex and dynamic nature of human-technology relations, the article contributes to the ongoing discourse on the ethical and societal impacts of digital technologies, providing valuable perspectives for future research and policy development. The study concludes by calling for a more integrated and

interdisciplinary approach to the study of digital technologies, one that recognizes the complex interplay between humans and technology and the need for a more comprehensive understanding of digital value in contemporary society.

References

1. Kučinskas, G. (2024). Generation of digital value through dynamic material hermeneutics: A postphenomenological analysis of human-technology relations with digital goods. International Journal of Science and Research Archive, 12(2), 1506-1516.
2. Esfahani, M. N. (2024). Content Analysis of Textbooks via Natural Language Processing. American Journal of Education and Practice, 8(4), 36-54.
3. Esfahani, M. N. (2024). The Changing Nature of Writing Centers in the Era of ChatGPT. Valley International Journal Digital Library, 1362-1370
4. Irwin, S. O. N. (2016). Digital media: Human–technology connection. Rowman & Littlefield.
5. Romele, A. (2019). Digital hermeneutics: philosophical investigations in new media and technologies. Routledge.
6. Deb, R., Mondal, P., & Ardeshirilajimi, A. (2020). Bridge Decks: Mitigation of Cracking and Increased Durability—Materials Solution (Phase III). *FHWA-ICT-20-016*.
7. Deb, R. (2020). Investigation of workability and durability of concrete mixes incorporated with expansive cement, poly-carboxylate admixtures, and lightweight aggregates. University of Delaware.
8. Kumar, C. S., Sathya, A., Deb, R., & Rahman, M. M. (2024). FMDB Transactions on Sustainable Environmental Sciences.
9. Joshi, D., Sayed, F., Saraf, A., Sutaria, A., & Karamchandani, S. (2021). Elements of Nature Optimized into Smart Energy Grids using Machine Learning. *Design Engineering*, 1886–1892. http://thedesignengineering.com/index.php/DE/article/view/1892
10. Al, D. J. E. a. D. J. E. (2021). An Efficient Supervised Machine Learning Model Approach for Forecasting of Renewable Energy to Tackle Climate Change. *International Journal of Computer Science Engineering and Information Technology Research*, *11*(1), 25–32. https://doi.org/10.24247/ijcseitrjun20213
11. JOSHI, DRUMIL, FAWZAN SAYED, JAI BERI, and RANJUSHREE PAL. "An efficient supervised machine learning model approach for forecasting of renewable energy to tackle climate change." *Int J Comp Sci Eng Inform Technol Res* 11 (2021): 25-32.