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## Dissection of Dependency A Crossdisciplinary Review

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### Abstract

*Life in the modern societies, principally in the Western world, has been demystified. This demystification process has caused the social structures like technology, to lose some of the charm they had during the early Industrialisation period. Information and Communication Technologies (ICTs) have become integral parts of our identity in the context of organizational and personal life; the dependence on technology blurs the line between real and virtual worlds. This paper attempts to bridge the gap in understanding our dependence on modern technology. An attempt has been made to dissect the human-technology dependency to find out how technology is interpreted, it's meaning in the modern world, and what are the working mechanisms that are feeding this dependency as it grows with the growth of ICTs. The paper concludes that there is neither a single source of dependency nor a root cause. Instead the answer lies deep within the mesh of social patterns and structure and how we interact with them. The dependency in question is much more a function of the properties people attribute to ICTs than of what an ICT can or cannot actually be made to do.*

**Keywords:** eDependency, Hermeneutics, Epistemology, Social Theory, Structuration, Philosophy of Technology

### 1 Introduction

*Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology. – Martin Heidegger.*

Life in the modern societies, principally in the Western world, has been demystified. This demystification process has caused social structures like technology, to lose some of the charm they had during early Industrialisation. Foucault (1990) explains this phenomenon in terms of sexuality, that is, in many eastern cultures the aura encircling sexuality has been purposely conserved to keep its value, whereas in the Western socie-

ties a science instead of an art of sexuality has become the norm. Norberg & Lundblad (2001) observe this phenomenon and reveal that “nothing is regarded as holy or secret in a modern society that has gone through centuries of Enlightenment” (p. 354). Consequently, it becomes more and more difficult to experience any discovery or enjoy the sense of mystery as the dependency to technology goes beyond mere connection and technology becomes a vital part of us.

Human dependency on technology (HDT) has become a rising issue in recent years. Information and Communication Technologies (ICT) are used with such frequency for personal use that these items become vital to our day to day routines. Take for example someone forgetting their mobile phone can be a devastating event. The feeling of being disconnected from the world may cause stress and anxiety. It almost becomes a part of ones identity as they do not feel complete when they are without a certain ICT. We – the human beings – are gradually drifting away from the traditional ways of communication, for instance, a simple face to face conversation is being replaced by instant (or text) messaging.

Technology has an enthralling effect on social structures and patterns – the more tantalizing a technology is, the bigger the change it will bring. Albeit we are often exasperated by having to conform to technological demands, we find that we cannot live without them. They lock us into some scenarios and out of others. Paradoxically, technology is a social product yet it promise to improve society (Robey, 1995), and ironically it inhibits us to develop or improve it further as the dependency strengthens. Our addiction to ICTs – e.g. mobile devices, internet – is eradicating the development of basic skills such as writing. The development of computers and automation is eliminating many jobs, ominously shaping business practices, and changing social patterns. Joseph Weizenbaum shed the light on HDT in his interview<sup>1</sup> (Long, 1985) where he elucidated:

"We are now, as a society, close to the point of trusting only modern science to give reliable knowledge of the world. I think this is terribly dangerous. The dependence on computers is merely the most recent – and the most extreme – example of how man relies on technology in order to escape the burden of acting as an independent agent; It helps him avoid the task of giving meaning to his life, of deciding and pursuing what is truly valuable." (p. 49)

Weizenbaum's words fell on deaf ears and more than 25 years later, after his technological heretic declaration, little has changed in man's relationship to technology. The reliance and HDT has been intensified and now directly proportional to the advances in ICT as the emerging technologies are making us even more tightly coupled to them. Recent research have related HDT to alienation and social exclusion (Zheng & Walsham, 2008; Franzen, 2001), addiction (Young, 2004), intimacy (van Manen, 2010), digital divide (Starrs, 1997; Moss, 2008), exercise of power (Bloomfield & Coombs, 1992; Lyon, 1993; Avgerou & McGrath, 2007), extending human capabilities (Lawson, 2010) and finally an arduous philosophical argument that technology being a social product, absurdly and ironically, has been reversed (O'Brien, 2004) and that “this relationship of dependence is not quite one of mutually self-sustaining symbiosis, nevertheless, we are more than mere parasites, we are auxiliaries” (p. 29). Such multifaceted viewpoints spanning prolific disciplines calls for a more basic, somewhat abstract, understanding of HDT to reveal and grasp the veiled connotations.

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<sup>1</sup> Also see “On the Impact of the Computer on Society” (Weizenbaum, 1972)

Given the various point of views on subtle and intricate nature of HDT, I initiate the investigation from an abstract philosophical point – Heidegger’s hermeneutics<sup>2</sup> – and pave the way to find the meaning behind this dependency using the epistemological<sup>3</sup> lens provided by Michel Foucault’s viewpoint and incorporating it in the realm of ICT. Finally, I synthesise both to develop a dual hermeneutics and epistemological lens to relate them to social theory in order to find how we can better understand the equivocal dependency in question.

## 1.1 Gap Analysis

ICTs have become integral part of our identity so much so that HDT blurs the line between real and virtual worlds. This paper attempts to bridge the gap in understanding our dependence to modern technology. The term ICT is used in two particular milieus, firstly virtual and social networks, hereinafter VSN, (e.g. Second Life, Facebook, Twitter, etc.) and secondly, the physical infrastructure on which they are deployed and accessed (mobile and wireless networks). I narrow it down to the two aforesaid contexts as they collectively encompass the question of identity (in the virtual world) and assert the effects of time and space.

## 1.2 Method

An extensive literature review was employed to understand the internal mechanisms behind the relationship between the [digital] hermeneutics and epistemology of ICT and use logical reasoning to relate them to modern social theory, which helps in presenting a vivid picture of social patterns and structures. Thus, sources from three aforementioned disciplines were utilized to develop the understanding of HTD. A conceptual analysis was essential to review the literature on *self* and analyse the working of the social structures that are ingrained in the actors’ subjective understanding.

## 1.3 Structure

I shall proceed on two fronts before converging to a single perspective. First, I lay down the core theories from the digital perspective, namely hermeneutics and epistemology and then relate them to a converging perspective of social theory. This synthesis is the foundations of this review. Secondly, key themes are identified, extracted and examined in light of the core theories. Finally, a discussion and some conclusions on our current level of understanding and consequences of technology dependency are offered.

## 2 Core Theories

This section furnishes a critique of Heidegger hermeneutics to establish the interpretation of technology and assessing it in the light of modern ICT with the help of

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2 In this review, hermeneutics means the theory of interpretation, i.e. the theory of attaining an understanding of texts, utterances, etc. The study of hermeneutics dates back as far as ancient Greece (SEP, 2005). Albeit, Heidegger’s hermeneutics are employed in this review, it should not be confused with 20<sup>th</sup> century philosophical movement.

3 Epistemology is the theory of knowledge and justified belief, which is concerned with the nature, sources and limits of knowledge as well as to understand the concept of justification. The main concerns of epistemology are “the creation and dissemination of knowledge in particular areas of inquiry” (SEP, 2005).

Capurro's (2010) digital hermeneutics. Moving forward, Foucauldian elements are introduced to understand the meaning of the interpretation and lastly converging the perspective to social theory and development of a synthesised lens to identify the main themes of the review in subsequent section.

## 2.1 Hermeneutics

José Ortega y Gasset<sup>4</sup> and Martin Heidegger<sup>5</sup> were the first scholars to see the “modern technology as a powerful force able to reshape the human condition” (Lucena, 2009, p. 99). Later, Heidegger (1949) went on to shed the light on the role and essence of technology in the modern world. According to Heidegger the things that we relate to must be understood as part of the world that we also are part of – an instrument is what it does and this in a context of assignments (Heidegger, 1949; Ihde, 1999). Take the classic example of a hammer, which is nothing in itself unless it is used in a certain context (e.g., driving nails). The same concept is applicable to ICT as there are many purposes and contexts of its usage. O'Donnell & Henriksen (2002), commenting on Heidegger and technology, posit that “ICTs are defined ontologically by our use of ICT” (p. 93). Consequently, we can say that ICTs are not what they are but where and how they are used i.e. it depends on the context and situation. Consider the example of a VSN, interpretation of ICT becomes obscure as one's real identity collides with a virtual persona. Building on Heidegger's work, Capurro (2010a) provides a more subtle digital hermeneutical interpretation of ICT, that it is “not just a means to an end or a mere instrument but in a more basic sense we are or exist online”. Though, the interpretation of Capurro is in line with Heidegger, finding the meaning of technology becomes intricate and manifold before we begin to contemplate an explanation of dependency. Thus, an additional epistemological lens for abstraction of meaning is required.

## 2.2 Epistemology

Foucault epistemological studies recognize the changing frameworks of production of knowledge through the history of such practices as science, philosophy, art and literature. He brackets out issues of meaning, which are essential to richer understanding of dependency. Rather than looking for a deeper meaning underneath discourse or looking for the source of meaning in some transcendental subject – Foucault analyses the discursive and practical conditions for the existence of truth and meaning (Dreyfus & Rabinow, 1983). In the context of ICT and the realm of meaning, Willcocks (2006) points out that Foucault reminds us of our “epistemological frailty and ontological uncertainties” (p. 291), which highlights our high usage and dependency on ICT, in terms of motivation to control, gain power (Brocklehurst, 2001; Moss, 2008), certainty (Townley, 1993), and knowledge in the face of risk and ambivalence (Capurro, 1996). Building on Heidegger's view of self, two Foucauldian elements are brought in to establish two-fold meaning of dependency – namely, self-discipline and self-care.

The phenomenon of self-discipline is in the realm of exercise of power. Foucault, rejecting the classical view of power as *legitimate authority*, claims that there is only ‘power,’ and the most insidious form of power is *self-discipline*, which comes from having internalized standards of normalcy from social institutions (Dreyfus & Rabinow, 1983). For

4 Meditación de la técnica, 1939.

5 Die Frage nach der Technik, 1945.

Foucault, Brocklehurst (2001) argues, self-discipline “becomes the means by which individuals are able to do anything — to think about themselves, to speak, even to derive sexual pleasure” (p. 459). The internet discourse is a primary example in this regard, similar to the panoptic power of self-discipline, internet users are inexorably sensitized to be “gazed upon,” and internalize that fear into becoming self-disciplining, docile bodies.

In the second related phenomenon, Foucault (1988a) calls the methods and techniques through which we constitute ourselves *care of the self* or ‘technologies’ of the self, which are devices that make the social construction of personal identity possible – in other words, the personal routines or disciplines that are adopted to reshape one’s identity. Wilcocks (2006) explains that they “take on a more active, used dimension, less geared to relations of power and discourse, more geared to bending force back on itself and so to self’s work on the self” (p. 277). In the context of ICTs, the internet, specifically social and virtual networks, are an example of such a ‘technology’ of self-care.

Foucault provides a valuable lens to examine the finer details of the definitions of technology and ICT applications. To understand the HDT, the epistemological view point of Foucault is the perfect fit against Heidegger hermeneutics to treat the technologies in an omnipresent manner, “whether these are invisible or visible, whether we know it or not” (Willcocks, 2006, p. 291). Here, I present the last piece of the jigsaw puzzle – the society and its relation to man, a social framework that is host to ICT in a parasitical manner.

### **2.3 Social Theory**

The central concern of the modern social theory (e.g., theory of structuration) is the relationship between individuals and society particularly in terms of structure/agency<sup>6</sup>. Society is an emergent phenomenon that is constituted in the process of interactions between human agency and social structures. In the current age ICTs can be seen as significant social structures and recent research in organizations (Käkölä & Koota, 1999; Orlikowski, 1992, 2000), knowledge economy (Wickramasinghe & Lamb, 2009) and cultural (Weisinger & Salipante, 2000) contexts have highlighted their pivotal role in modern societies.

Emerging from the works of both Heidegger and Foucault, rejecting traditional dualistic views that see social phenomena as determined either by objective social structures, which are properties of society as a whole, or by autonomous human agents, Giddens (1984) proposes that structure and agency are a mutually constitutive duality. Thus social phenomena are not the product of either structure or agency, but of both. Social structures are neither independent of agency nor agency independent of structure. Rather, human agents draw on social structures in their actions, and at the same time these actions serve to produce and reproduce social structure. This relationship exemplifies the concept of human agency that contests the importance of cognitively or even discursively shared meaning (Weisinger & Salipante, 2000) – that is, the structural properties of social systems, such as those conceived of as cultural, or conflict as social activity, do not exist separately from human action. Rather, structures are better seen as

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<sup>6</sup> Structure can be defined as rules, resources or “pattern” but remains an elusive term with no formal definition, which “in its nominative sense, always implies structure in its transitive verbal sense,” so it is both a noun and a verb whereas agency refers to “efficacy of human action” (Sewell, 1992).

recurring patterns of action – ‘in and through their activities agents reproduce the conditions that make these activities possible’ (Giddens, 1984, p. 2), which principally means that the way in which we act is determined by the context – we reproduce the accepted context. However it is our actions that shape the context – these structures, even in the context of ICT, only exist because we enact them.

## 2.4 Synthesis

The works of Heidegger, according to Dreyfus (1987), play the pivotal role in philosophical evolution of Foucault<sup>7</sup> whose ideas, though somewhat neglected in the ICT studies, have high similarities to Heidegger’s views on technology. There are numerous similarities between the two theorists, for instance, like Heidegger, for Foucault, as pointed out by Willcocks (2006), “to judge technology by its tools and its production is to miss the point” (p. 276). Moreover, Heidegger and Foucault share the view that individuals in modern society are to some extent determined by technological structures pervading that society. Both argue that the view of human beings as a kind of manipulable resource is essential to the technological management of society; both also suggest that liberation from this state of affairs requires a radical renegotiation of the nature of human being as presently construed (Rayner, 2001; Ziarek, 1998). Given these parallels, the core ideas related to this review are presented next to co-ordinate Foucault and Heidegger’s accounts.

Converging forward, Giddens’ (1984) structuration has its roots in “transmutation of hermeneutics and phenomenology initiated by Heidegger” (Giddens, 1984, p. xxii), and it is presented as compliment to Foucault’s epistemology. The self is the most micro level of analysis and is solemnly explored by Giddens, with some brief mention of Foucault (e.g., Giddens, 1992, p. 30). For Foucault, the self is manipulated / developed through *technologies of the self* – practices that are arguably parallel to as well as foundations of Giddens’ (1992) *bodily regimes* – which operate under the discourse of self-regulation and discipline. A subtle glimpse at the cohesion between these two theorists is also found in Foucault’s (1988a) discussion of the self in *Technologies of the Self* (p.25) where he states that the “self is a reflexive pronoun” although he does not develop this much more than questioning the development and sources used for the formation of identity. Such ideology is central to Giddens’ understanding of social actors where the agency involved in the reflexive monitoring of action as well as the reflexive nature of the self and body. Giddens’ reflexivity, and Foucault’s understanding of self-surveillance are essentially referring to similar tactics; the main distinction lies in the amount of agency attributed to individual actors. To combine these two perspectives: individuals are reflexive agents, subjected to the practices of disciplinary society, who possess and exercise agency.

Ostensibly, it may be argued that these two theorists hold utterly deviating perspectives. Though Foucault’s work is intricate and multifarious in different ways, I propose that via probing his work, rather than positing Foucault as the antithesis of Giddens, the two bodies of work in fact complement each other.

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<sup>7</sup> In his final interview, Foucault (1988) revealed, “my whole philosophical development was determined by my reading of Heidegger” (p.250).

### 3 Literature Review

Using the synthesis compiled in previous section, what follows is the identification of three themes from the research literature – namely, *Gestell* (or the essence of technology), Technologies of the self, and Structuration of technology.

#### 3.1 Gestell

According to Heidegger, the essence of modern technology is *revealing* and *enframing*. Ciborra (2004, 2005), commenting on Heidegger, explicates that ICT is revealing in a sense that it challenges nature, people, society, and the world we live in, enframing in such a manner that it has the enabling and aligning characteristic of an infrastructure. Heidegger calls it *Gestell*<sup>8</sup>, which recent research have related to the modern ICT infrastructure (Ciborra, 2004, 2005; Ciborra & Hanseth, 1998; Capurro, 2010, 2010a). *Gestell* beckons to be seen as socio-technical networks where artefacts – social and/or technical – are linked together into networks, thus, the essence of an infrastructure is the movement, the enchainment, the multiple actions (Ciborra, 2004). Hence it refers to the fashion of “ordering and setting up” that divulges social and technical resources, which are available for future deployment, and in this light, *Gestell* vividly reflects on the modern VSN and physical networks in terms of scalability and growth as well as ICTs as enabler rather than a driver. Moreover, it brings to surface two important issues – Identity (*or loss of it, in the real and virtual world*) and Trust (*toward technological tools*) – and how it affects us. The next two subsections briefly discuss these topics.

##### 3.1.1 Identity

The use of ICTs not only shapes the context we use them in to but also our existence in the given environment. This power normally exercised by ICTs is to achieve a specific meaning, for example to relate ourselves to the aspects of the world that technologies intensify. Kiran & Verbeek (2010) explains this phenomenon by stating ICTs “co-shape the appearance of the world; we do not just see a world, the world appears to us in certain ways: technologies structure and organize the world” (p. 417). Explicating further, they mention that our actions are altered by ICTs because “we perceive the world itself differently” (p. 418). For example, a visual aid – be it tangible like 3D glasses or intangible like virtual reality – enhances our experience in a way that allows us to see things differently. For Heidegger, entering into a free relationship with technology means to be able to experience and let coexist different attitudes toward the world. This brings the question of multiple identities to surface. Dreyfus & Spinoza (1997, p. 172) claim that Heidegger perceive technology as “disaggregating our identities into a contingently built up collection of skills, technological things solicit certain skills” and rejects the need for a single identity in the realm of technologies. This lack of a single identity enables us, on the other hand, to be sensitive to the several *other* identities we have when we are engaged in ‘disclosing’ the diverse milieus (Dreyfus & Spinoza, 1997), in non-technological frame of references.

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<sup>8</sup> Literally meaning the frame, the shelf, the skeleton though the scholars agree that connotation is more enframing in nature (Ciborra, 2004; Capurro, 2010a).



### 3.1.2 Trust

Linked to identity, trust is another central dimension in the relationship between man and ICTs. Kiran & Verbeek (2010) argue that technologies and technological artefacts help to constitute human subjectivity, and that trust in technology has the nature of confidence, as we trust *ourselves* to technology. This is in line with Heidegger's analogy of the hammer, which highlights the importance of its *reliability*. We can say that a tool cannot be used if it is untrustworthy. Kiran & Verbeek (2010) put emphasis on trust and explicate that it does not even require a direct experience, only engaging indirectly is enough to establish the trust, ergo, by applying the phenomenon to technologies that ICTs are worthy "if we can rely on them—if not; we need to pay attention to the things themselves, rather than to what we can do with them" (p. 418).

## 3.2 Technologies of the Self

Heidegger assigns care a pivotal role in human existence by arguing that "human beings are beings who are concerned about their own being" (Kiran & Verbeek, 2010, p. 422). Our existence is shaped by our careful intersection with other beings. The intricate mesh of humanity and technology as well as technologically mediated character of human existence adds another dimension to this care-structure of human existence (Kiran & Verbeek, 2010). Consequently, we can say that involving oneself with technologies is, at the same time, a form of self-care (Capurro, 1996) and internet discourse (Aycock, 1995) is a prime example of it.

It is Capurro (1996, 2010), who first introduced the hermeneutic theory of Heidegger into the field of ICT and later incorporated Foucault's idea of "technologies of the self" to propose self-oriented – instead of act-oriented – approach toward digital ethics. The view of human beings as the target of information ethics in this meaning rejects the information processing model *homo informaticus* proposed by classical informatics, and builds on Heidegger ideology in the realm of the relationships of the meanings. Takenouchi (2004), discussing the digital hermeneutics of Capurro (1996), concludes that to design ICT means also to design one's own existence and hints with this turn of view, the hermeneutic paradigm shift of ICT sciences. Next, the coexistence with technology is explained in terms of information ecology and related ethical challenges are explored.

### 3.2.1 Ecological View

The technologies of the self are an example of *synthetic thinking*<sup>9</sup>, Capurro (1996) concluded on his commentary on Foucault and ICT, in the sense that we concede our communal dependencies: "dependency of man on nature and technology, of technology on nature and man, and of nature on man and technology." These dependencies shape our lives and social patterns, but, Capurro warns that the impact of ICT on society is non-neutral, ambiguous and contradictory. As a coping mechanism a model of information ecology (Capurro, 1990, 2008) is developed to counter the ambiguities caused by ICTs on the individual and society. The ecological model responds to the impacts on four grounds:

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9 A synthetic perspective, presented by Capurro (1993), "enables the understanding" of the mutual dependencies between man, nature, and technology and "avoiding the fallacies" of humanism, naturalism and technicism. In the era of ICT, there is a challenge, which Capurro refers as "synthetic thinking," to engage in the virtual world

- Digital divide – the expanding chasm between the *information rich* and the *information poor*.
- Technological colonization – counteract the mass expansion of technologies in the life-world.
- Cultural alienation – prevent the isolation triggered by the digital divide between groups, societies and groups of societies.
- Exercise of power – the “oligarchic control” of information resources.

The ecological model (Capurro, 2008) also reminds us of the limitations of man and his “surrogates” – the digital agents – and informs us that instead of fixed perspective on “basic norms”, more flexible methods could be used for understanding the enduring changes of ICT on society / nature and vice-versa.

### 3.2.2 Ethical Challenges

Capurro (1996) discussing Dreyfus & Rabinow’s (1983) summary of Foucault’s ideas on ethics, elucidates that we are knitted in a mesh of possible choices in a process of becoming – individually and socially – ourselves in various milieus and ICT is one of them. Expanding further, he argues that the quest for ourselves is ethically preceded by the questioning through the other, and the technologies of the self would be misconstrued if it were not interpreted as the juncture where we take care of our mutual relationships in the face of social patterns and structures. This means that we cannot treat ICTs as simple tools by denying their roots in our social patterns e.g., cultural practices. Since ICTs are already embedded in our lives, instead of removing, Capurro stresses on a *synthetic* perspective to grasp the mutual dependencies between man, nature, and technology and being concerned with “what we think and do” in and via ICTs means looking for the crossroads between it and *technologies of the self* as a constant struggle – and this signifies ICTs as an ethical challenge.

This brings the review to the final theme where I briefly present the dependency in terms of the human-technology relationship revealed by the process of structuration.

### 3.3 Structuration

The ICTs do not simply allow us to execute certain tasks, which we are unable to do so otherwise, it enables us to perceive and act in the world in a diverse fashion. We – human beings – are seen as coping being, from Heideggerian perspective, we are already in the world involved, and co-shape ourselves via the intersection with technology (Dreyfus, 1987). Thus, ICTs can be seen as enabling actions; that “enables us to relate to the world in manner not hitherto known” (Kiran & Verbeek, 2010, p. 418), and these interactions, as a result, reproduce and shape the social structures (Sewell, 1992). Giddens (1984) calls this phenomenon the “duality of structure”; it is in this way that structures can be seen to be both the medium and the outcome of interaction. Such recursion, which Giddens refers to as structuration, takes the form of two dualities (Lawson, 2010):

- Giddens’ (1984) the *duality of structure* stresses that structure is both medium and outcome of our interaction.

- Bhaskar's (1998) the *duality of praxis* stresses the fact that some structures are reproduced without the result or need of an action.

Lawson (2010), summarizing structuration, argues that the social structure, in that it exists prior to a certain action, is clearly not reducible to that action, but, in that it only exists (i.e. an emergent feature of) social activity. It is neither external to nor outside of human activity. ICT is an example of such emergent features that are reproduced and reshaped through interaction. The next subsection focuses on the duality of technology.

### 3.3.1 Duality of Technology

Orlikowski (1992, p. 419), in her discussion on the structuration of technology, highlights the manifestation of Heidegger's analysis of tools which when they "become more taken-for-granted than they are already, the ability for [users] to reflect on them and hence act without or beyond them becomes more remote." She concludes that the more 'seamlessly' ICT facilitates executing an action, the more it will be taken-for-granted, which then silently constrains human action. This duality of technology breaks down the time-space nexus, according to Orlikowski (1992, p. 421), the time-space disjuncture "is collapsed...by understanding that technologies have different degrees of interpretive flexibility." Käkölä & Koota (1999) emphasise this point and illustrate that there is flexibility in how people interpret/use ICT, but that this flexibility is a function of the building blocks of the artefact, the context in which an ICT is fashioned and invoked as well as the power, knowledge, and personal interests.

The causality between the time-space severance and the 'interpretive flexibility' of ICT is summarized by Orlikowski (1992): "The greater the temporal and spatial distance between the construction of a technology and its application, the greater the likelihood that the technology will be interpreted and used with little flexibility" (p. 421). Such structuration of technology is a vivid example of how the duality feeds the HDT in a seemingly innocent yet powerful manner. Finally, as shown in the last point, the dependency, as result of structuration, does not observe the rules of time-space and is scalable in a sense that it grows with the growth of technologies.

## 4 Discussion

The results of this review demonstrate the value of a cross-discipline (hermeneutics / epistemology / social theory) conceptualization of HTD. It is valuable in explaining how the dependency is established by dissecting and examining it under different lenses and as the result the review opened up multiple avenues for future research. In summary, there is neither a single source of dependency nor a root cause; instead the answer lies deep in a mesh of social patterns and structure and how we interact with them. The dependency in question is much more a function of properties people attribute to ICTs than of what an ICT can or cannot actually be made to do. Another outcome of the review is not only the impact of ICT on the individual and society is ambiguous but also the HTD is not necessarily evil; nor is there any silver bullet for the extreme situations where the dependency has paralyzing effects. Due to the intricate nature of studies it is neither possible to synthesis the results to establish a common answer nor conclude a definite answer. Collectively, there are three upshots of the review, which are argued to be a fertile avenue of future research, they are:

- i. Dependency to technologies enhances our other identities, which are operative in non-technological life-world.
- ii. Trust increases dependency – the more reliable a technology is, the more we will be inclined to use it, and the more use will render dependency.
- iii. Capurro’s information ecology model discussed in this review is argued to counteract the ambiguity of ICT, but what kind of impact has it on our trust to technologies?

On a final note, reemphasising the earlier point that *we* co-shape *ourselves* through the interaction with technology, the HTD is one of the inevitable outcomes of this interaction. But what is the solution, or one’s responsibility, to contain this dependency; as Weizenbaum (1972) advocates, the real question to ask is not "what shall I do?" but rather "what shall I be?" I have attempted to reveal that the answer to the question lies in the social patterns and our regular interaction with ICT, by reassessing the role of technology, and using the tools provided by ICT in a manner, which will enable and facilitate the personal development rather than enthralling the actors.

## 5 Conclusion

The case of HDT is a curious one – is this a positive or negative thing? The answer to this simple question is far more complex as the review concludes. It is natural to think that this dependency is “normal” since it is no longer a luxury but a necessity. It is equally valid to think that this dependency is “abnormal” since technology is a social product but the society, to some extent, has become dependent on its own product, ergo, inhibiting the development of a socio-technical framework that could explain, or even resolves, this dependency in a positive manner. We cannot afford to ignore the effects of HDT anymore, if we deny this fact, we are engaging in self-deception – and one wonders is this a case of *mundus vult decipi, ergo decipiatur*<sup>10</sup>? It is vital to attain the understanding of the dependency, and by doing so, sustain the meaning in the digital age. I conclude on a healthily sceptical note with the words of Dreyfus’ (2009, p. 137) warning that “where meaning is concerned, what the Net is doing to us is, in fact, making our lives worse rather than better. Living one’s life on the Web is attractive because it eliminates vulnerability and commitment but [...] this lack of passion necessarily eliminates meaning as well.”

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<sup>10</sup> A saying attributed to 1<sup>st</sup> century Roman satirist Petronius, literally meaning “The world wants to be deceived, so let it be deceived”

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