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Critical theory and the question of technology: The Frankfurt School revisited

Gerard Delanty
University of Sussex, UK

Neal Harris
Oxford Brookes University, UK

Abstract

Unlike the first generation of critical theorists, contemporary critical theory has largely ignored technology. This is to the detriment of a critical theory of society – technology is now a central feature of our daily lives and integral to the contemporary form of capitalism. Rather than seek to rescue the first generation's substantive theory of technology, which has been partly outmoded by historical developments, the approach adopted in this article is to engage with today's technology through the conceptual apparatus offered by the early Frankfurt School. This rationale is guided by the conviction that the core ideas of critical theory still offer a sound basis for assessing the nature of technology today. Through a reconstruction and engagement with some of the core concepts of first-generation critical theory, as well as the work of Bernard Stiegler and Andrew Feenberg, we can arrive at a more robust theory of technology, capable of critically interrogating the role of technology in contemporary society.

Keywords

capitalism, critical theory, digital technologies, the Frankfurt School, Andrew Feenberg, Jürgen Habermas, Herbert Marcuse, Bernard Stiegler, technology

The critical theory of the early Frankfurt School offers one of the most important engagements with technology in modern thought. This paper revisits this rich scholarship to assess current developments in technology. While the writings of Frankfurt

Corresponding author:
Gerard Delanty, University of Sussex, Falmer, Brighton BN1 9RH, UK.
Email: G.Delanty@sussex.ac.uk

School theorists have been much discussed, there is still scope for further reflection on the place and significance of technology in critical theory. Unlike the first generation of critical theorists, contemporary critical theory has largely ignored technology. Two exceptions stand out. Hartmut Rosa, in a significant work on acceleration as a key dynamic in modernity, has incorporated an account of technology, although it is not his aim primarily to offer a theory of technology as such (Rosa, 2013). The prodigious work of Andrew Feenberg has cast considerable light on the question of technology in critical theory, while bringing it into productive dialogue with Science and Technology Studies (STS). This paper in part builds upon his work, as well as that of Bernard Stiegler, but offers a different approach to the problem of technology as regards its philosophical grounding. It is not the aim of this paper to offer a new theory of technology as such; nor is the objective to salvage the now somewhat opaque theories of technology advanced by first generation Frankfurt School scholars.

Instead, our strategy is to re-approach the question of technology through the more general framework of critical theory, rather than specifically taking that tradition's own account of technology as the principal basis. This rationale is guided by the conviction that the core ideas of critical theory offer a basis for assessing the nature of technology today. However, to develop this we need to go beyond the theory of technology as such in critical theory. Through a reconstruction of some of the core concepts of critical theory, we can identify limits in past and contemporary scholarship and can arrive at a more robust theory of technology. The central question, then, that this paper is addressed to is: how should technology be understood when viewed through the lens of critical theory?

To answer this question an account of the theory of technology across critical theory will be provided as a starting point. The second section offers a contemporary assessment of the relevance of the theory of technology in critical theory, taking recent literature on digitization and surveillance capitalism as examples that appear to confirm the prognoses of first-generation critical theory. While broadly sympathetic to the concerns of critical theorists in their critique of technology, it is argued that we need to expand, and further develop, their ideas. The third section looks at other approaches to technology which either go beyond critical theory (STS, Stiegler, for example), or, as in the case of Feenberg's work, seek a synthesis. We argue that these alternative approaches to technology, while correcting many of the shortcomings of critical theory, do not offer an adequate solution to the problems they grapple with. The latter sections of the paper seek to resolve these problems by providing a brief reconstruction of some of the core concepts of critical theory (Section IV) and then recasting contemporary technology through this framing (Section V).

I The question of technology in critical theory

One prominent feature of the early Frankfurt School, unlike post-Habermasian currents, was that it was very concerned with technology. For Adorno and Horkheimer, the question of technology was closely connected with the question of nature itself.[1] A superficial view might be that this was an expression of the disdain for modernity that was a pronounced feature of European thought in the first half of the 20th century.[2] The

disdain with technology was especially prevalent in conservative critiques of modernity, as in the work of Spengler (1926 [1918]), Mumford (1934), Gehlen (1989 [1957]) and Ellul (1964 [1954]). Such themes are also pertinent in Martin Heidegger's work;[3] in an influential essay in 1954, Heidegger saw a fundamental discord between the actuality of technology in modernity and an alternative deriving from its hidden 'essence' (Heidegger, 1977). Whatever this alternative was, it was not consonant with modernity.

While the Frankfurt School's critique of technology shared this anti-technological inflection, which was not unconnected with their dislike of the USA with which the triumph of technology was associated, it was predicated on very different assumptions about modernity and future possibility. Frankfurt School scholars were primarily critical of the association of technological advancement with progress and, unlike the conservative critique of technology, they saw a close connection between technology and capitalism. Moreover, there is no indication of nostalgia for a pre-technological past in the Frankfurt School texts. While Adorno and Horkheimer are deeply critical of the instrumental, identity-thinking characteristics of Enlightened thought, their immanent-transcendent methodology retains an investment in the latent potentialities of the present. In short, the present requires the rational critique of irrationality, not a regression to a pre-technological age. Despite their deep pessimism about the future, the past could not offer a refuge from the present.

The Frankfurt School account of technology was significantly shaped by Marx and Weber. Lukács' *History and Class Consciousness* (1923) is perhaps the foremost exposition of their synthesis in Western Marxism: drawing equally on Marx's theory of capitalism and the Weberian theory of rationalization. This framework allowed first generation Frankfurt School scholars to go beyond Marx's view of technology as machinery: as something which complements labour, while remaining substantially distinct. Unlike much of later Marxist theory, they also did not see technology as simply reducible to capitalism but identified technology as having its own dynamics. Although Weber operated with a reduced notion of '*Technik*' as a form of instrumental rationality distinct from value rationality, his wider theory of rationalization, as exemplified in the famous motif of the 'iron cage', gave a crucial sociological foundation for an account of technology as a form of instrumental rationality. Capitalism could thus be conceived of as being both technologically driven while being an expression of something more pervasive, namely instrumental rationality.

With this concept, which in effect was the master concept through which early critical theory came to understand domination, technology could be viewed through a Marxist perspective while simultaneously going beyond it in capturing its cultural dimensions. In contrast to the conservative critique of technology, its positive aspects could also be seen in making possible new cultural realities. In this respect, the writings of Benjamin are important. Benjamin was sensitive to the new kinds of aesthetic experience emerging technologies made possible, and conscious that the 'aura of the work of art' would not survive in the age of mechanical reproduction (Benjamin, 1973: 223). Modern culture is no longer based on an original that has a presence in time and space. Technology allows culture to be free from the burden of aura and authenticity that previously tied aesthetics to tradition. Modern culture is post-auratic, which leads to the 'shattering of tradition' that comes with a change in perspective.

While Benjamin saw modern technology creating a potential for radical cultural transformation, Adorno argued that he did not sufficiently consider the capacity of capitalism to create a culture industry that would thrive on the new possibilities for entertainment and enable a pseudo-authenticity. Benjamin's work nonetheless brought new perspectives to bear on technology and culture that greatly influenced critical theory in the critique of popular culture. It also captured the ambivalence at the heart of modern technology between its redemptive and its regressive character. However, there can be no doubt that the understanding of technology as primarily regressive prevailed. Adorno and Horkheimer (1997 [1944]), in the *Dialectic of Enlightenment,* clearly held a critical view of technology as an instrument of domination and a major source of reification. In later writings, Adorno saw potentially progressive applications in the use of radio as opposed to the television, which he regarded as fundamentally regressive.[4] Yet, as evidenced by *Minima Moralia* (1978 [1951]), there is little doubt that Adorno overwhelmingly saw technology as an expression of an instrumental rationality which induces reification and dispels the critical temperament.

A basic problem with which first-generation critical theorists grappled is the separation of means from ends in the conception of technology. Unlike Arendt and Heidegger, who also saw in technology the triumph of means over ends, they did not see the solution to be a return to an earlier stage in the history of humanity when technology remained goal oriented, as in Arendt's (1958) account of the tool model of technology where humanity was in control of technology. But with the arrival of the age of instrumentalism technology loses that direct relation to a goal. For critical theory, the aim is rather to reassert goals than bemoan modern technology as such.

Marcuse provided the classic account of technology in critical theory as a form of 'technocracy'. In 'Some Implications of Modern Technology', Marcuse (1982 [1941]) argued that technology can promote authoritarianism and that the Third Reich had clear technocratic elements which accelerated its transition into a war economy. For Marcuse, creeping technocracy precipitated a substantial change in social relationships, which were increasingly mediated by mechanical processes. Modern technological rationality, manifest in industrial capitalism, is based on convenience, efficiency, standardization; it leads to adjustment and atomization, and the loss of personal autonomy. Technological rationality erodes critical rationality. In *One-Dimensional Man*, Marcuse's critique of technology became part of a more general critique of ideology: technology is presented as both a means of social control and an ideology in itself. It is an ideology in the sense that the pervasive spread of technological rationality makes impossible the conception of an alternative society or way of thinking.

Despite the confluence of technology and capitalism, Marcuse nonetheless believed that a critical rationality can prevail, but only if it resists technological rationality and creates a radically different society. The problem, then, is not technology, but technocracy. The 1941 essay clearly opposes anti-technological politics such as an 'anti-industrial revolution'. His position is one in which technology can be humanized and democratized against technocracy.

For all his utopianism, Marcuse had no sense of how a post-capitalist society would be realized. Despite achieving unusual resonance with the students' movement, his 'new sensibility' lacked an accompanying formulated philosophy of transition. He certainly

was not naive enough to think that emergent technology would deliver a socialist future. However, he did see the necessity for technology to be part of the creation of a more human future. His understanding of technology – in contrast to the camera in Benjamin or the radio with Adorno – was limited to examples that fall into the category of industrial standardization, such as the Fordist assembly line. But this is also complicated. The instrumental and the cultural dimensions of technology cannot be separated. Consider the case of a washing machine, which liberates people, historically predominantly women, from tedious gendered work, but is also an item of consumption and a major product of industrial capitalism. The washing machine does not in itself make possible critical thought but creates a space for cultural transformation. Instrumental kinds of industrial technology can be used for human liberation, but they are also at the very core of capitalism. A post-capitalist society cannot do without such items even if it is indeed possible that entirely new kinds of technology could be created. The reality is that technological products are produced under the conditions of capitalism.

Marcuse is clear that technology is not neutral but embedded in social relations and in systems of production: 'Technology as such cannot be isolated from the use to which it is put; the technological society is a system of domination' (1964: xvi). A machine can be neutral in the sense it can be used for different purposes, but it is always located in a social context (see also Marcuse, 1989 [1958–9]). While making material progress possible, including an improved quality of life, technology produces a new unfreedom because it prevents the individual from becoming autonomous and people come to see themselves only in their commodities. In the final analysis, technology leads to reification and enables social control to become anchored in the new needs which capitalism produces.

Marcuse's target is not in the end technology but what he calls 'technological rationality', or technocracy: the instrumental use of technology for domination. This includes the more general worship of technology as the ultimate expression of modernity (see also Noble, 1999; Nye, 1994). Reverence of technology cultivates an affirmative view of society and thus conceals an ideology of uncritical acceptance. Since his account of technology did not discuss specific technologies, other than passing references to the iconic consumer goods of post-war American society such as the TV and the car, it is more plausible to see his account of technology in terms of its instrumentalization without any regard for desirable political goals.

The entire critical theory tradition, based as it was on German intellectuals born in the early 20th century, inherited the 19th-century German tendency to see technology in terms of *Technik* (instrumentalism/technique). With the ascendancy of German engineering and the growing status of science in the 19th century, the notion of *Technik* gained currency and the term was adopted in the human and social sciences. It replaced the older and more cultural notion of *Technologia*, which emerged in the 16th century around the science of the arts (Schatzberg, 2018). *Technik*, the term, used by both Marx and Weber and other German scholars such as Sombart and Heidegger, was introduced into the English-speaking world by German intellectuals to give the older notion of technology a new meaning that reflected the dominance of science and related to the material aspects of civilization.

The result was a bifurcation in the cultural and the instrumental conception of technology, whereby the term lost its cultural associations with the Greek notion of *techne*, which contained notions of craft and art in contrast to *episteme*, denoting knowledge. The notion of technology, including the term itself, when it emerged in the 16th century captured both *episteme* and *techne* until it was re-invented around a scientific conception. Technology as a term was not in common usage until the 1940s, when it re-emerged to mean much the same as *Technik*. But the creative and cultural dimension of the older notion of technology was not entirely expunged. It was supposed to be contained in part in *Technik*, in that science, the basis of technology, requires the creative power of invention and is thus, in part, cultural. However, this notion of *Technik* did not satisfy a wider and more encompassing conception of technology that could accommodate what Heidegger referred to as the 'essence' of technology. This new notion of technology sought to capture both the instrumental and the cultural dimensions of technology, but in a way that gave prominence to its material aspects. It was undoubtedly this notion of technology that lay behind Marcuse's theory of technology and which can be seen to contrast with the more conservative critiques of technology.

After the first generation of critical theory, the theory of technology disappeared from the horizon of critical theory. Habermas's work has given scant attention to technology. An exception was a 1968 essay, with the telling title of 'Technik und Wissenschaft als "Ideologie"', in which Habermas takes issue with what he saw to be Marcuse's belief in a 'New Science' that would make possible a New Technology. Habermas disagrees with this utopianism, seeing technology as residing within the domain of purposive-rational action. For Habermas, technology *qua Technik* is a matter of the technical control of nature and thus to a degree is neutral, so long as it is confined to that domain. Communicative rationality, in contrast, is not primarily instrumental but social. The upshot of this reasoning is that technology is not social as such and is therefore excluded from communicative action. Such a position seems comprehensively outdated by the rise of social media.

Habermas's argument is that since the end of the 19th century there has been a tendency towards the 'scientization of technology' whereby science and technology have become a leading productive force and an integral part of capitalism (see also Habermas 1975). Technology, and the science that makes it possible, cannot lead to emancipation since they have become a substitute for politics which becomes only a technocratic matter of finding technical solutions to societal problems. Technology is ideological in that political solutions are seen as technical ones. In the final analysis, Habermas agrees with Marcuse that technological rationality invades the social world, distorting communicative rationality.

Later critical theory has been muted on technology. Habermas's major works did not give any place to technology, which has generally been seen as an expression of instrumental rationality and related to systemic integration. With the underlying sense of *Technik*, non-instrumental forces are necessarily seen as residing outside the compass of technology. The basic assumption that pervades his work, that technology is non-social, is deeply problematical, as is the contrary view that technology is necessarily a form of domination. The claim made in *Knowledge and Human Interests*, that knowledge of nature is based on prediction, is also very questionable in its assumption that

predictive-based knowledge is value free if not applied to the social world. Habermas's objection was against the application of the methods of the natural sciences to the human and social sciences. While this generated important insights in the shaping of post-positivistic social science, it did not question the rationality of the natural sciences. The problem is that the critical theory tradition can see technology only in terms of the model of machinery or a non-social instrument, and that it is in tension with the social nature of human action.

It is clear that Habermas has held to a contradictory position that saw technology as outside the domain of the life-world and therefore as non-social, while at the same time it is a possible source of domination, as when it becomes a substitute for politics. This position commits him to a view of domination as non-social. As Feenberg (1996) has shown, Habermas is committed to a view of technology as essentially neutral in that it is bound up with what he called a cognitive interest in technical control, as announced in *Knowledge and Human Interests* in 1968 (Habermas, 1974).[5] Later developments in critical theory, as in Honneth's theory of recognition, have ignored the place of technology. However relations of recognition are to be conceived, it is difficult to avoid the question of technology in mediating such relations. In a similar view, the various concerns of contemporary critical theory, whether in normative political philosophy or in post-colonial critiques, the question of technology remains curiously absent.[6]

II Rethinking technology: Was the Frankfurt School right?

It is clearly necessary for critical theory to take a new look at technology, which is part of the fabric of social life and constitutive of the ontology of the social (see Lawson, 2018). Two possible options can be identified before moving to an alternative. The first is to try to rescue the theory of technology contained in the writings of the first generation of the Frankfurt School and to apply it to developments of the present day (the second is discussed in the next section). Despite the problems intimated in the previous discussion, their basic ideas are by no means to be dismissed as irrelevant today. Recent literature on technocratic power in many ways confirms their conception of technology as the all-pervasive growth of instrumental rationality. It is true that their work was primarily concerned with the expansion of industrialism, while today, in the post-industrial digital age, the nature of technology has fundamentally changed. The tremendous transformation in the technological foundations of contemporary society show too that technology is not stable but in constant change. However, that may in fact be precisely why technology has the potential to be a major form of domination.

The Frankfurt School's critique of technology has exerted considerable appeal in contemporary scholarship due to its central concern with instrumental rationality and related technocratic forms of power. An illustrative example is Berry's (2014) theory of the shift from the culture industry to the computational industries. Berry seeks to apply critical theory to the digital age to understand the dialectic of its democratizing and totalizing powers. His work captures the ambivalence of the Frankfurt School. On the one side, digital technologies are presented as calculative rationalities, yet it is clear that they have gone beyond purely instrumental uses for production and the storage of information. Digital technologies are also empowering but can easily become

instruments of reification and the basis of new kinds of governmentality (Berns and Rouvroy, 2013).

This perspective is present in other contemporary literature, which recalls the Frankfurt School's critique of technology. Seymour (2019) sees the dystopian world of platform capitalism as extracting the affective, individual particularities of platform users and repackaging their desires, hopes and communicative expressions as a commodity experience. Twitter is presented as akin to the 'Twittering Machine' of the Paul Klee painting: blending humanity and machinery into an artifice of self-perpetuating commodification, instrumentality, and extraction. Similarly, James Bridle's *New Dark Age* (2018) reconstructs the approach to technology presented in *Dialectic of Enlightenment* for today's digital world. For Bridle, the paradoxical irony is that the more information we are exposed to, our capacity to identify 'truth' from 'post-truth' is proportionally impaired. The logics which perpetuate the effortless dissemination of 'information' serve to sever our capacity for critical inquiry. For Bridle, what seems to have been a democratization of information exchange is in fact an expedited elite-capture of information exchange processes. While the process of book and article publication is comprehensible, if inaccessible to most, few beyond a small group of experts understands, and determines, the algorithms undergirding digital platforms.

Bridle's account also furthers two other, central Frankfurt School themes. While for Adorno, a foundational deficiency of Enlightened thought was the rise of 'identity thinking', which led to the conceptual domination of the particular, for Bridle, the information age has precipitated the rise of 'information thinking'. This is the mistaken belief that all problems can be solved by computerized systems if enough data can be harvested. While Horkheimer wrote that the Enlightenment reduced nature to 'a heap of things' (1993: 81), and Marcuse submitted that technological modernity led to the ascent of the 'technological a priori' (Marcuse, 1964), Bridle similarly claims that the information age has led to subjects who view the world as resembling computational potential and raw data. As data is an abstract, weak representation of the richness of social reality, our phenomenological experience of the social world, and our attendant appreciation of it, diminishes (Bridle, 2018: 43).

Reading these accounts of the transformation of technology and its extension into the inner realms of subjectivity, there is a certain fatalistic sense of technological determinism at work, akin to the 'iron cage' of rationalization described by Weber. However, from a critical theory perspective, the transformation of society by technology is not to be accounted for by technology in itself. The digital age is held to be predominantly a product of capitalism but also of counter-vailing forces. While the origins of the internet do not lie specifically within capitalism, the internet developed within the structures of capitalism, and is substantially driven by the imperatives of capitalist accumulation.

Zuboff's analysis of 'surveillance capitalism' serves to draw out the particularities of this relationship. She argues that the digital economy has created a new kind of capitalism based on surveillance. For Zuboff, the accumulation of big data produces a 'behavioural surplus' which is used not only to predict human behaviour but also to modify it (Zuboff, 2019: 8). The product is a new kind of commodity whereby the user provides the input in the form of behavioural data, which is then used to predict the behaviour of the user. Her argument takes up one of the main themes in the critical

theory of the Frankfurt School concerning the commodification of technocratic power. Surveillance capitalism gives rise to a new kind of power, which she terms 'instrumentarianism'. This is held to exert a powerful hold over society through a complex system of 'smart' networked devices. The new capitalism may be a post-industrial form of capitalism, but it remains, nonetheless, capitalism. The population as a whole, the users of Google, Facebook, Amazon, etc., provide the raw material, which, in effect, is their lives. This is not too far removed from Marcuse's account of the 'one-dimensional society' where workers continue to serve capitalism through the appropriation of free time when leisure is the prolongation of work.

A further theorist who has successfully deployed Frankfurt School themes to engage the challenges of contemporary technological societies is Christian Fuchs. In *Critical Theory of Communication* (2016), Fuchs stresses that the Habermasian theory of communicative action (Habermas, 1986, 1988) is impotent to explain the myriad intersecting forces which impact the communicative realm in the digital information age. By way of an alternative, Fuchs returns to Marcuse, Adorno and Lukacs to construct a dialectical theory of communication. Yet, Fuchs' account also seeks to move beyond the traditional Frankfurt School understanding of technology, and he stresses the importance of engaging with both lesser-known works by Lukács – for instance, his *Ontology of Social Being* (1978) – and a range of other thinkers who are not usually considered to be part of the Frankfurt School tradition: Vygotsky, Baudrillard, Williams. Fuchs thus retains an investment in the critical theoretical apparatus for engaging with technology but moves beyond the canonical authors.

The various literature discussed in the foregoing shows that the writings of the Frankfurt School on technology are very pertinent to the different circumstances of the present. Their work reveals that technology is not neutral but that it is shaped by society and driven by capitalism. All the major digital corporations are capitalistic businesses whose driving force is the profit imperative.

However, it must also be recognized that despite their extensive power, digital technologies are not total systems of control. This is perhaps where critical theory is weak in that it does not offer enough insight into how technocratic power can be controlled, resisted and mobilized by critical publics. Yet, a distinctive dimension of critical theory is that it does seek to bring a normative perspective to bear on domination, even if it is not clear how the normative order of society can assert itself over surveillance capitalism and the forms of technology it has cultivated. This is especially challenging in that any such alternatives will have to use much the same forms of technology. The challenge of bringing mega-digital giants such as Facebook under democratic control of the constitutional state through legislation for privacy, criminality and the political use of data is compromised by the fact that the state is itself undermined by the very forces it seeks to control. As Marcuse argued in *One-Dimensional Man*, technology is not neutral, it is socially situated within particular social conditions: within a relationship between 'science', 'technology' and the mode of production. Hence Marcuse calls for a 'new sensibility', a new way of engaging with the world at large, including the technical objects which proliferate within the social domain. As Marcuse argues, technology is neither neutral to the social order, nor intrinsically good or bad. Digital technologies retain a substantial latent potential to be emancipatory, to further communicative

exchange and to reduce unnecessary toil and suffering. The challenge for critical theory is to extricate such potentialities from the logics of domination within which they are situated, and which, to a great extent, they currently serve to perpetuate.

Digital apps, such as those used by Amazon, Uber, and Facebook, can be used for both good and bad purposes. Surveillance capitalism is certainly capable of considerable manipulation of user behaviour through covert and often illegal practices. When this extends to voter behaviour, as in the practice of political parties buying Facebook ads, there is a new area that presents major challenges for democracy.[7] Despite the propensity for domination, digital technology has diverse applications and can also facilitate a critical rationality as much as enable an all-pervasive technical rationality. This is where critical theory needs to rethink its theory of technology, the analysis of which does not appear consistent with the basic idea of immanent critique (see Section V).

III Beyond the Frankfurt School's critique of technology

The previous section offered a possible line of defence of the Frankfurt School's theory of technology. Despite the fundamental difference between the kinds of technology the first generation had in mind and the new digital technologies of the present, there is considerable resonance in the notion of instrumental rationality. The apparent growth of new and pervasive technocratic domination is clearly something that needs to be explained in a way that brings a normative perspective to bear. But beyond that general position, there can be no doubt that the critical theoretical engagement with technology thus far has too little to offer. This becomes all the clearer when we look at recent critical theory which fails to provide anything of a substantive account of social life and its material conditions of existence.

One major limitation of critical theory's own account of technology is that it operates with the notion of technology as *Technik*. This instrumental conception of technology does not accord with the social ontology of technology which does not conform to the older notions of automation and de-humanization. While Habermas wrote on contrasting 'communicative' and 'instrumental' rationalities and identified divergent systemic and lifeworld logics, today the fabric of social life is thoroughly interwoven with technological processes. As such, it is impossible to consistently hold that technology resides within a separate social domain, distinct from communicative or other forms of social interaction: we daily communicate via WhatsApp, Instagram, Hangouts, Skype. The new technologies of digital modernity are not static and Fordist but, portable, personalized and, increasingly, intangible. We pay for our drinks from our digital wallets, we may even store our capital in cryptocurrency. Digital technologies mark both new and changing affordances and new discourses about social reality. For Fischer (2010: 235), this notion of technology as discourse is productive insofar as it captures the capacity for technology to give form to, and shape, our social worlds. We cannot exist beyond technology and increasingly cannot comprehend social life without it. This may in part explain the sense of shock at the realization that YouTube is just over a decade old: digital technologies have reshaped our conception of social reality to an extent it is increasingly difficult to imagine a world without them. Byung-Chul Han's (2017a, 2017b) work takes this further, arguing that our capacity to appreciate both beauty and

love has been reshaped in various ways by our total enmeshment within technical-consumerist rationalities. As such, the understanding of technology as primarily a vehicle for the spread of instrumental rationality, as evinced in Lukács and Weber, is not adequate to understand technology's constitutive role in contemporary social life.

The limitations of critical theory's account of technology have led to other approaches to engaging with technology within social theory.[8] These will not be discussed in any detail here, other than to indicate the main lines of theorizing and taking Stiegler and Feenberg as major proponents of a critical theory of technology.

Bernard Stiegler's work offers an elaborate framework for a new approach to technology. In *Technics and Time,* he argued that both the subject's capacity for transcendence and the subject's imagination of transcendence are thoroughly imbricated within a world of *technics* (1998; also Stiegler, 2008, 2011). His core insight is that *technics* lies at the core of human experience and of time. Human existence is necessarily embedded in temporality, but we can access our past temporality only through technics, which is not reducible to instrumentality, as Heidegger believed. Action requires *technics*, which also offers an opening to the future. These ideas, developed through a critical engagement with Heidegger and various French philosophers, have been more recently applied to a critical philosophy of the internet, which is very much in keeping with the Frankfurt School's theory of technology but incorporates a stronger argument for an alternative technology. In *The Neganthropocene* (2018) and in a collection he edited, *La toile que nous voulons* [*The Internet We Want*] (2017), Stiegler argued for a technology that is based less on 'entropy' (essentially the movement towards fragmentation, destabilization and disorder) than on 'negantrophy', a concept that expresses a form of integration that makes possible human flourishment and care (Stiegler, 2017, 2018). Today technology, above all digital technology, is moving the world towards entropy, but must be resisted. The 'internet we want' is a social network that serves human needs rather than the needs of capitalism.

Despite his critique of the descent into nihilistic entropy as a result of the hegemony of algorithmic surveillance, automation and the dominance of digital capitalism, Stiegler is optimistic about the potential for a radical transformation of the internet and the search for a remedy for a civilization that has become ill. These ideas, expanded in *Age of Disruption* (Stiegler, 2019 [2016]), also reveal his debt to the argument of the *Dialectic of Enlightenment* concerning the barbarism of reason. In the end it would seem the countervailing forces of negantrophy are overwhelmed by the descent into entropy.

Stiegler's philosophy of technology has much in common with the work of Andrew Feenberg, who is also broadly sympathetic to the Frankfurt School's theory of technology while recognizing the need to go beyond it. Both theorists have much in common: a critical approach to Heidegger, the abiding influence of the *Dialectic of Enlightenment*, and an appreciation of the writings of Simondon. Feenberg, who refers to Stiegler's work, argues for the synthesis of critical theory and the constructivist approaches characteristic of Science and Technology Studies. The latter is clearly the most influential approach to both the theory of technology as well as empirical research. Like critical theory, STS is anti-technocratic and an expression of radical thought, though its inspiration derives from postmodern theory rather than from modern thought. Perhaps one difference is that it is more explicitly anti-deterministic than what one might

conclude from the Frankfurt School's writings. Although they opposed technological determinism, the Frankfurt School theorists had no real concept of what Feenberg refers to as 'democratic interventions', a concept that is in keeping with Stiegler's negantrophic pleas for a new internet (Feenberg, 2017a, 2017b).

STS brings the perspective of the social actor more firmly to bear in the creation of technological systems, which are never simply self-creating but are context-dependent.[9] Adopting a strong constructivist stance, as in the so-called 'Strong Programme', STS theorists tend to see technological systems as products of human artifice and interests rather than objective structures. In other versions, as in Actor-Network Theory, as espoused by Latour, John Law, and others, technological systems are amalgams of objects and social actors. This is not the place to offer an assessment of STS and other constructivist schools of theory, including Foucauldian applications (see Berns and Rouvroy, 2013). It will suffice to note that in the present context, the relevant consideration here is the necessity to have a stronger recognition of the individual actor in the shaping of technological systems, which are not totalizing systems of domination. STS approaches, and in particular those that reflect ANT perspectives, have the additional advantage in going beyond the paradigm of *Technik* that has restricted the vision of the German tradition in theorizing technology. While this has clearly led to productive research on technology, it remains unclear what a synthesis of STS and critical theory can precipitate. Feenberg's main claim is that it allows us to see technology as embedded in its social context. That is important but it is hardly an original insight, as Susen (2019) has pointed out. The tendency in ANT is clearly towards posthumanism in its aim to go beyond the distinction between humans and nonhumans. Whatever the merits of this may be, it is not easy to reconcile STS's post-humanism with the essential humanism of critical theory. This is one small disagreement we have with Feenberg.

However, more importantly, Feenberg's aim is to develop a notion of democratic interventions into what he calls 'the technosystem', in effect the task of bringing technocratic power under the control of democratic bodies. Feenberg is correct in showing that STS approaches offer a corrective to the tendency in critical theory to see technology as primarily a force of domination and reification. Communicative forms of rationality, to follow Habermas, can exist alongside instrumental rationality. However, culture and power are not separate forces. The great contribution of Feenberg's recent work is the demonstration that 'the technical is already cultural' (2017a: 153). What he calls the 'technosystem' is composed of different components, which are never reducible only to technology. They entail markets, administrative and legal systems, for example, and are contextualized in moral systems and forms of life. Democratic interventions can occur on different levels. It is not a case of a monolithic edifice facing hostile opponents.

In a recent and deeply insightful article, Feenberg, taking the example of the internet, shows how technology – a term that can now be used to capture the notion of *Technics* – can offer great promise for democracy without succumbing to technocracy (Feenberg, 2019). The core of his arguments resides in the claim that that the internet, which is not a unified entity, reshapes political participation through processes of mediation and by enabling the raising of consciousness, leading to self-awareness and action. While the emancipatory core of the first decade of the internet has been lost with the dominance of an instrumental digital capitalism, the internet has the potential to harness the legacy of

the New Left and advance democratic socialism, which will require a new mode of governance that cannot do without technical expertise. This is ultimately because 'the internet is a medium of communication, it cannot be contained within the bounds of the economy' (Feenberg, 2019: 238).

In sum, rather than trying to salvage the Frankfurt School's theory of technology, as discussed above, there are clearly alternative approaches available to advance it. Taken together, there may be some merit in a new synthesis of these critical theories of technology. The aim of this paper is not to argue against this strategy or to offer a rebuttal of STS/constructivist approaches, which in fact are less theories than methodologies. The contribution of the present paper is to show that if we go beyond the Frankfurt School's own theory of technology and approach the question of technology from the more general framework of critical theory, a distinctive understanding of technology can be reached. The writings of Stiegler and Feenberg offer good directions in this endeavour. One striking aspect of their work insofar as it concerns the internet is the implicit suggestion, which recalls Marcuse's vision of a 'new science', that the internet offers the possibility of a new technology. We do not disagree with these arguments but seek to situate the vision of technology they advance within the wider theoretical framework of critical theory, as opposed to its theory of technology. To understand the transformative potential of technology, we need to locate it within something that goes beyond technology itself. In other words, with an ironic reference to Heidegger, the essence of technology is in an understanding of the social world of which it is part. But to take this further we need recourse to a theoretical framework. This brings us back to the core concerns of critical theory.

IV Critical theory revisited

Critical theory is distinctive in its focus on identifying discourses and practices that hold radical transformative potential. This concern derives from the left-Hegelian roots of the Frankfurt School project: the dialectical method focuses on discovering contradictions and avenues for their sublation. For the purposes of the present paper we limit our discussion to a brief summary.

Unlike Ideal Theory,[10] for example, an immanent-transcendence approach engages with social reality itself and seeks to identify latent phenomena within the social world which push actors to transcend the given social formation and its associated norms. This may occur due to actors being confronted with the explicitly contradictory nature of social logics.[11] The disclosure of such contradictions serves to compel social actors to challenge, and move beyond, the social and self-understandings imbued by the dominant structural logics. As such, following Strydom, immanent-transcendence is connected to the development of social learning processes and changing understandings of the social world (Strydom, 2020).

The Hegelian concept of latency is significant to the immanent-transcendence approach: there are possibilities for change which exist within the present social order (Hegel, 2010: S47, S62). The central component required for social subjects to transcend the dominant social norms is the awareness of a less contradictory form of social reason, or social being, pregnant within the social order. The possibilities for transcendence are

thus held to be present within the immanent social world; the challenge for critical theory is to disclose these potentialities. Such avenues for transcendence are revealed by either their embodiment in cultural models (i.e. democratic systems, the law, erotic-mimetic experience) or through the mediating influence of concepts and norms (equality, freedom, etc.).

Critical theory's commitment to immanent-transcendence precipitates a particular form of social critique: immanent-critique. As expressed above, the focus is on social reality, and identifying possibilities for transcendence within the contradictions present in the social order. This conception of critique is reflexive insofar as it is predicated on the disclosure of a divergence between the subject's self-identified norms and ideals and their manifest social actuality. By disclosing these contradictions both the essential requirement for, and possibilities of, transcendence emerge. This emancipatory impetus connects to the Freudian belief in the subject's anxiety response to the awareness of unsustainable contradictions. The subject desires resolution in the form of transcendence. Immanent critique is thus based on the analysis of deep potentialities and social learning processes borne out of subjects' anxious drive to transcend disquieting contradictions (Honneth, 2014: 686–90). This psychoanalytic impulse is conjoined with the reflexive drive to transcend the discrepancy between idea and reality within the subject's social self-understanding.

Intimately connected to this immanent-transcendent approach is critical theory's focus on social rationality. Returning to the Hegelian reworking of the Kantian understanding of 'regulative ideas of reason', critical theory views the social totality to be a manifestation of dominant forms of rationality. 'Reason', from such a perspective, is held to be both a cognitive capacity of social subjects and also manifest in the logics and structures of social institutions: the market, democracy, cultural forms. To speak of the capitalist market as manifesting a form of reason is to suggest there is a particular form of thought which is perpetuated by, and manifested in, systems of market exchange (for example). For first generation Frankfurt School scholars, this capitalist form of thought was pathologically 'instrumental', connected to viewing the world as mere material for exploitation and extraction. For Adorno and Horkheimer (1997 [1944]), this market logic was connected to a foundational limitation of the 'identity thinking' precipitated by the Enlightenment, in which the particularities of the social world are understood as mere contingent manifestations of universal concepts. Clearly such claims are distinct from the idea that the social world perpetuates 'norms' or 'values'; for critical theorists, the claim is that social institutions are both a product of, and yet crucially also bring forth, primary generative social processes.

Such an account does not necessitate a hard determinism. As expressed above, social subjects both operate within, and serve to challenge, dominant social forms of rationality. As the contradictions embedded in social processes are disclosed by historical processes, subjects challenge the generative forces, seeking alternative, non-subsumptive rationalities. The critical theoretical investment in immanent-transcendence is best framed relative to the challenge of locating emancipatory potential within the social world which can help disclose contradictions within manifest social rationality.

Yet, critical theory does not solely aim to advance a critique connected to the disclosure of contradictions. In addition to being 'critical' the tradition has always been invested in 'theorizing': in placing social-cultural logics within their broader context. Once again resonating with Hegelian themes, critical theorists consider it essential to understand the relational nature of social phenomena, and as such they champion an explicitly interdisciplinary form of analysis. The interconnections between subjectivity, economy, culture, psychology, and geography are all objects of analysis. Indeed, the latticework which is the social totality is held to be undergirded by logics which are latent with emancipatory potential. It is often at the intersections of competing social rationalities that the potential for rupture is greatest. Thus, to truly understand the contradictions within the social order, critical theorists seek to theorize the locatedness of contested social practices. In particular, the relationships between subjectivity, rationality, reflexivity, objectivity and latency need to be critically theorized.

In summary, critical theory is distinct in its focus on identifying possibilities for transcendence within the social world. It offers both a unique form of critique and a substantial theory, locating social practices within the complex enmeshment of competing social logics. A central feature of the critical theoretical method is a 'thicker', Hegelian-inflected understanding of reason: the idea being that social processes and institutions are both instantiations of, and serve to precipitate, forms of rationality. Technology, as shown below, when viewed through such a lens, presents as a substantially more ambivalent force than the negativity of early critical theorists might suggest.

V Considerations towards a contemporary critical theory of technology

While it is not our desire to present a new critical theory of technology within this article, what we seek to offer is the identification of themes which come to the fore when technology is viewed through the lens of critical theory. Our submission is that the conceptual frameworks developed by first-generation critical theory offer important insights for exploring technology *today*. Following Strydom (2020), we contend that the immanent-transcendent approach, unique to critical theory, would suggest an analysis of the potentialities and actualities which technology presents to the social world. Such an approach would focus on identifying possibilities for transcendence through the identification of contradictions within the interwoven nexuses of economic, social, political and cultural concerns through which contemporary technology is both reflexively understood and manifested.

A central task for a contemporary critical theory of technology would be to adequately situate technology within the present social totality. As Marcuse (1964) argued in *One-Dimensional Man*, and, as discussed in the foregoing, returned to more recently by Feenberg (2013), technology is not 'neutral' in social processes, yet neither is it inherently a force for emancipation or domination. As Feenberg (2013, 2017a, 2019) articulates, 'science', 'technology', and 'capitalism' are inextricably connected. In theory, the emergence of a new economic model could radically transform the function of technology within society, embracing its emancipatory and world-disclosing

potentialities. The particularities of the current relationships between 'science', 'technology' and 'capitalism' are thus of fundamental importance; however, they are yet to be substantively researched *through a critical theory lens.* The locatedness of 'technology' within neoliberalism, and its problematic contemporary relationship to 'science', are self-evidently a rich site for analysing normative conflicts and thus potentially an avenue for radical social transformation. However, an alternative economic order will not emerge on its own. Feenberg (2019) correctly sees the impetus coming from what he calls democratic rationality opposing instrumental rationality. Both rationalities are concrete realities and play out against the technical background of social life. This argument is not unlike Habermas's account of modernity in terms of a clash of two kinds of reason, instrumental/functional versus communicative, but differs in seeing technology as part of the fabric of social life as opposed to being located in one.

While researching the relationships between technology, science and capitalism is an essential constituent for a future critical theory of technology, to fully understand the impact of technology on the social totality a much broader engagement is therefore required. Technology has radically reshaped the global order: the internet connects people instantly on opposite sides of the globe in exchanges ranging from first dates to drone attacks. The empirical realities of the globalized world bring forth new and contested cosmopolitan normativities: in Zuckerman's (2013) prose, we are increasingly 'digital cosmopolitans' living 'in the age of connection'. Technology must be understood as central to these processes. Similarly, technology has impacted patriarchal and racist structures, both with emancipatory and reactionary outcomes (Faulkner, 2001). In societies with clear gendered divisions of labour, the advent of labour-saving devices served to liberate women from hours of back-breaking labour. Simultaneously, new surveillance techniques mean that often racialized care-workers are increasingly monitored and policed. A critical theory of technology today would need to engage with the complex location of technology within these contested and interconnected social structures. Such an analysis must seek to locate technology within the broader forms of *reason* which exist within the social totality.

While past engagements linking technology and rationality advanced a problematic bifurcation into 'technical' and 'communicative' reason, a contemporary critical theory of technology would need to transcend such a division, which has been rendered untenable through the evolution of technical-communication affordances. Today, it is increasingly impossible to consider communication without technology. When analysing how technology has impacted social rationality, two key considerations would need to be foregrounded.

First, as Marcuse draws out in his understanding of the 'technical a priori', technology shapes how subjects view the world: it shapes their foundational psychological and cognitive processes. Yet simultaneously, technology is profoundly reshaping the external world in ways that make social logics harder to identify: our cities are increasingly augmented by technical affordances, driving us towards 'hyperreality' (Baudrillard, 2009). Technology's impact on the subject's cognitive capacities is a primary concern for critical theory, yet so too is the subject's capacity to identity divergent layers of 'reality' within digital modernity. Today, technology mediates the subject's experience of both the objective and intersubjective world; technology is

increasingly a precondition for subjects to experience mimetic or erotic phenomena: consider Tinder, Imax cinema, Netflix (Stiegler, 1998, 2008, 2011). A central concern for a critical theory of contemporary technology is both to understand how the subject's form of rationality is impacted by technology and how the subject needs to develop new cognitive capacities to survive and engage critically with the emergent capitalist hyperreality. There is no escape for the subject into an isolated a-technological realm; soon one might even say subjectivation itself requires technological literacy. A central challenge for a contemporary critical theory of technology would be to research the impact of technology on the subject's capacity for critique, for non-instrumental thought, and the new cognitive capacities required to flourish in digital neoliberalism.

Second, in keeping with the research programme of first-generation critical theory; a critical theory of technology would need to engage with the impact of technology upon social rationalities. The dominance of technology serves to naturalize and entrench extractive market logics based on exchange and efficiency. The central market imperative of the ruthless extraction of profit is normalized through technological mediation. Subjects are petrified and commodified in their representation on digital affordances, reduced to quantitative scores. As technology structures ever more areas of the social world, subjects have to transform their identities to be legible to new technological forces. The erasure of the particularities of the subject, and their collapse into functions, was a central theme of *Dialectic of Enlightenment* (1997 [1994]). A central concern for a contemporary critical theory of technology becomes analysing the impact new technologies have on normalizing and accelerating these dynamics.

A concern uniting research into the foregoing themes would be the identification of contradictions within the social world which hold latent emancipatory potentials for transcendence. As presented in the above, a critical theory of technology would provide an extensive analysis of the normative conflicts which exist at the intersection of technology and science, and technology and the market. The desires for collegial scholarship, for shared research, for free-inquiry, and the associated norms of academic integrity and solidarity are antithetical to the primary market diktat of predictable returns on investment. As discussed above, 'technology' stands in a particularly complex relationship to capital and to science; changes in the form of either can radically transform the normative assumptions of the technical sphere. Such normative contradictions are disclosed by the world-expanding character of technology and the cosmopolitan values which emerge, however latently, in the processes of globalization.

When viewed through the lens of critical theory, technology seems a social domain ripe with possibilities for precipitating transcendence. A critical theory of technology would serve to identify such contradictions through an analysis of the relationship between science, technology and capital, through an analysis of the world-expanding normativities it precipitates, and the reductive, commodifying impacts technology poses to the subject as a social being within capitalism, and to the subject's reflexive self-understanding.

VI Conclusion

Undeniably much has changed in the world, and in technology in particular, since the writings of the first generation of Frankfurt School critical theorists. Today, technical

affordances are increasingly central in world-creation and world-disclosure; past conflicts between 'instrumental' and 'communicative' rationality seem to have been comprehensively outmoded by technological invention and the complexity of new technical objects. Yet what we hope to have presented in the foregoing is that the Frankfurt School still has much to offer by way of an analysis of technology. We have consciously not dismissed out of hand the analyses of first-generation critical theorists on technology; rather we have identified their limitations and stressed that today's world of technical objects simply requires a different theoretical understanding and critical interrogation. Some substantive analysis from the first generation remains pertinent and incisive, while some does not. In contrast, and as argued throughout the above, the theoretical infrastructure provided by first-generation critical theory has not lost its potency and, if anything, has become more relevant. The focus on identifying latent potentials for transcendence within the immanent social world offers a plethora of productive avenues for future research. A critical theory of technology, built using the methodologies provided by Frankfurt School theorists, could provide a different and much needed critical account and, as such, serve as a substantial contribution to the broader theoretical literature.

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Notes

1. The question of nature in critical theory is beyond the scope of this paper (see Vogel, 1996).
2. See Herf's (1985) study on reactionary modernism and the critique of technology.
3. For an excellent discussion of the role of technology in Heidegger and Spengler's work, see Swer (2019).
4. For an extended discussion on Adorno's views on the potential democratic uses of communication technologies, see Mariotti (2014).
5. Feenberg (1991, 1995, 1996, 2010) has written prolifically on technology, critical theory and modernity.
6. A notable exception is Rosa's theory of social acceleration, which entails a consideration of technology (Rosa, 2013). Habermas (2003) also contains a discussion of the new genetics.
7. See Chun (2006), Fuchs (2018), Frischmann and Selinger (2018).
8. For a useful survey, see Matthewman (2011).
9. See, for example, Pinch and Bijker (1987), and for an overview Fuller (2006).
10. Ideal Theory refers to a dominant strand of analytic political philosophy. Ideal theorists, such as Rawlsians, argue that one must theorize justice (or any normative ideal) in isolation from an analysis of the present social world.
11. For a contemporary example, consider George Monbiot's attempts to make explicit the contradiction of infinite growth with finite resources (see https://www.monbiot.com/).

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Author biographies

Gerard Delanty is Professor of Sociology at the University of Sussex, Brighton, UK. His most recent publication is *Critical Theory and Social Transformation* (London: Routledge, 2020) and, as editor, *Pandemics, Politics and Society: Critical Reflections on the Covid-19* Crisis (De Gruyter 2021). Other recent publications include: *The Cosmopolitan Imagination* (Cambridge University Press, 2009), *Formations of European Modernity, 2nd edition* (Palgrave, 2019), *Community, 3rd edition* (Routledge 2018), and *The European Heritage: A Critical Re-Interpretation* (Routledge 2018).

Neal Harris is Lecturer in Sociology at Oxford Brookes University, Oxford, UK. His most recent publication is *Social Pathology and Social Research* (Palgrave Macmillan, forthcoming 2021). His current projects include a monograph titled *Critical Theory and Social Pathology* (Manchester University Press, 2022) and a volume co-edited with Onur Acaroglu, Thinking Beyond Neoliberalism (Palgrave Macmillan, 2022). His research has appeared in *Social Science Information, European Journal of Social Theory, International Sociology*, and *Studies in Social and Political Thought*.