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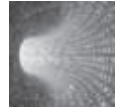
>> Version of Record - Nov 20, 2013

OnlineFirst Version of Record - Jan 13, 2013

What is This?

Determining social change: The role of technological determinism in the collective action framing of hackers

Johan Söderberg
University of Paris-Est Marne-la-Vallée, France

Abstract
This article takes the political engagement of hackers as a prism for examining the relations between technological determinist thinking and collective action. The concept 'collective action framing' is borrowed from social movement theory to describe how hackers have appropriated notions of a post-industrial, information society in their struggles against intellectual property laws and state censorship. Hackers have reintroduced an element of conflict and antagonism into otherwise politically innocuous visions of post-industrialism. This residual of antagonism can be traced back to the roots of the post-industrial myth in Marxist, historical materialist theory. By exploring these origins, the article proceeds to compare the hopes invested by hackers in the emancipatory force of information technology with the earlier beliefs of labour movements that the forces of history were on their side. Building on this comparison it is argued that technological determinism does not always lead to political resignation, but can also serve as a foundation for collective action.

Keywords
Collective action framing, hackers, historical materialism, Marxism, social movements, technological determinism

Corresponding author:
Johan Söderberg, University of Paris-Est Marne-la-Vallée, LATTS, 5 bd Descartes, 77454 Marne la Vallée Cedex 2, France.
Email: johan.soderberg@univ-mlv.fr

Introduction

The expansion of intellectual property laws has politicised hackers and related groups of computer users in new ways. One notable example is the mobilisation of free software programmers against the attempt to introduce software patents in the European Union (Karanovic, 2008). Another case was when hackers campaigned against digital rights management (DRM) technology – that is, technological fixes which prevent users from accessing and modifying software applications (Gillespie, 2006a). Even more transgressive groups of computer users have initiated political parties. In the 2009 elections to the European Parliament, the Swedish 'Pirate Party' received 7% of the votes and won two seats. Their party programme focused on privacy issues and the right to freely access information (Andersson, 2010). One epithet which has been suggested for addressing these computer-related issues is 'cyberpolitics' (Liu, 2004).

Social scientists hold opposing views about the significance of cyberpolitics. For some, hacking is greeted as a spanner in the works of neoliberal globalisation. Support for such an estimation can be found in the adoption of free software by leftist governments in South America (Shoonmaker, 2007), or the endorsements of free software by the World Social Forum (Giuseppe, 2005; Lee, 2006; Smith and Smythe, 2009). Concurrently, others see hackers as the vanguard of the 'technological sublime' of capitalist societies. Indeed, when the statements of hackers have been analysed by scholars, what has been observed has pointed to a commonsensical, liberal or libertarian understanding of the world and a strong bent for explaining social change with reference to technological development (Borsook, 2000; Liu, 2004; Morrison, 2009; Wyatt, 2004). It has often been assumed in the academic literature that such ideas stand in opposition to political engagement. Even those scholars who hope that hacking might revitalise old struggles for social justice remain wary of hackers' unrestrained passion for computers. They fear that the emancipatory potential of hacking will succumb under a lust for technology for its own sake (Islam, 2008; Taylor, 2005).

It is this tension between technological determinist thinking and collective action which will be discussed in this paper. I claim that this tension is characteristic of cyberpolitics. To some extent it owes to the fact that hacking practices stem from an engineering culture (Gillespie, 2006b). Although the notion of being apolitical has a long tradition in this setting, many have become politicised in recent years in response to new intellectual property laws, the spread of DRM and so on. The writings of the open source advocate Eric Raymond will be taken as a showcase of the kind of technological determinist thinking which circulates among hackers. Central to his reasoning is the claim that industrial society has given way to a post-industrial, information society. At a closer look, it turns out that this claim has emerged as a technocratic, depoliticised version of Marxist, historical materialist theory (Barbrook, 2007; Dyer-Witheford, 1999).

The shared, historical roots of post-industrialism and historical materialism allow me to revisit the academic critique of technological determinism. Taking a cue from the early labour movement, with its deterministic understanding of historical materialism, I contend that a belief in technological determinism does not rule out collective action. What the image of a fixed future does is to immobilise the political opponent, while, among those who are promulgating a deterministic worldview, it may serve as a mobilising tool.

Drawing from social movement theory, I will argue that hackers have appropriated the post-industrial narrative with its technological determinist undertones as their 'collective action framing'. They reinterpret it to give meaning to their own existence and the struggles in which they are immersed. An element of antagonism is thus put back into the post-industrial narrative, recalling its origins in Marxist thinking.

My claim is that deterministic viewpoints are underdetermined. This implies that the statements of hackers cannot be treated as having a fixed meaning. This is a rule of thumb of general validity, of course, but it seems to be extra pertinent when discussing hackers, since they are engaged in creating new things that overturn the meaning of our constituted categories (Kelty, 2008: 94). Therefore, care must be taken when the statements of hackers are assessed with the help of externally derived categories, such as when technological determinism or technocracy are being criticised from a scholarly perspective. Although I recognise that this kind of critique has its place too, it needs to be balanced with an 'immanent critique' (Antonio, 1981); that is to say, an approach where the claims of hackers are provisionally accepted on their own terms. The immanent critique would then proceed by exploring the internal contradictions of the claims of hackers. This could be done, for instance, by highlighting the discrepancy between their deterministic ideas and their practices.

Politicised engineering cultures

It should be acknowledged from the outset that the figure of 'the hacker' is highly diverse. What it means to be a hacker is continuously subject to renegotiation among hackers and non-hackers alike. Consequently, the word has been invested with varying significations at varying times and in different places (Coleman and Golub, 2008; Söderberg, 2010). The variety of hackers notwithstanding, ethnographic research has also pointed to the existence of a shared background of cultural references, values and ideas. I agree with Christopher Kelty that we need a vocabulary for addressing this commonality. He retrieves the old notion of 'public' in order to speak about crypto-anarchists, wireless activists, self-acclaimed pirates, free software developers, hacktivists, and so on with a single, all-inclusive heading. These people, he argues, are in the process of constituting themselves as a 'recursive public'. Christopher Kelty decides against using the word 'hacker' when talking about this public, due to the connotations of subversiveness and/or criminality which have been established in news media (Kelty, 2008: 35). I prefer to hold on to this term, as the people in question seem to be doing, since the jury is still out on the connotations of the word 'hacker'. Except for this, I am following him in adopting an inclusive, tentative approach when naming the subject.

There is a partial overlap between Kelty's recursive public and Tarleton Gillespie's 'engineering cultures'. One idea which Kelty finds to be popular in the recursive public is an understanding of technology as an autonomous force acting on society from the Outside (Kelty, 2005). Likewise, Gillespie notices that technicist, apolitical ideas and values are prevalent in the milieu he is studying. He then continues to investigate how these ideas are being harnessed for political purposes. Gillespie looks at a campaign for a so-called 'end-to-end' internet architecture which argues that the administration of information flows should be located at the end of communication networks. This

end-to-end solution is contrasted with more centralised architectures where decisions about internet traffic are taken at intermediary stations in the network. Advocates of the former approach endorse it as the technically most advanced solution. Although the case is being made on technical grounds, it is understood that the end-to-end design has implications for how control is distributed in networks (Gillespie, 2006b). It is for this reason that critics of the current intellectual property regime have spoken in support of end-to-end solutions (Lessig, 1999). Conversely, allies of the cultural industries are urging for more centralised network architectures facilitating the enforcement of intellectual property claims (Stefik, 1996). In other words, the highly politicised controversy about intellectual property legislation is here subdued under a seemingly technical, apolitical argument about how the internet actually works. The conclusion Gillespie draws is intriguing:

> The deliberate depoliticisation of engineering discourse, cleansed of its social ramifications as mere problem-solving, only masks the way in which both artefact and discourse are deliberatively built both to grapple with political questions and to move into other arenas where they may contribute to political projects. (Gillespie, 2006b: 440–441)

Similarly, ambivalence among hackers towards the claim of doing politics has shown up in Anita Chan's study of hackers who rallied behind a legal proposal in Peru. The proposal mandated the use of free software in public administration. It was authored in 2001 by a Peruvian congressman. The initiative got worldwide attention after a senior executive of Microsoft and the US ambassador in Peru tried to intervene in the parliamentary process. Subsequently, free software programmers all over South America started to organise in defence of the bill. They published articles, petitioned politicians, and held public meetings. All of these activities qualify as old-school, grassroots mobilisation. In the article, Chan directs the reader's attention to the mixed reactions that these campaigns received on the global hacker scene. Much of the response was positive. The legal correspondence in Peru was spontaneously translated into numerous languages and inspired similar initiatives in other countries. At the same time, however, columnists in the Linux business press lamented the involvement of state authorities in promoting free software. It was preferable, according to them, if the spread of free software stemmed from its technical merits alone and the free choice of consumers. Similar reservations were voiced by the leader of the Free Software Foundation, Richard Stallman. He asserted that the kind of state support that he was wishing for was an end to government intervention in the creation of intellectual property laws (Festa, 2001). In Chan's words:

> To such Northern free software advocates, politicized arguments for free software not only seemed to be a weak rationalization for a technology's use, but threatened to pollute more 'legitimate' technologically-based justifications for free software's adoption. (Chan, 2004: 534)

In a second article about the Peruvian case, Chan stresses the contending voices of the free software camp. No spokesperson stepped forth claiming to represent the group as a whole, nor did any single interpretation or ideology take precedence in the campaign (Chan, 2007). Out of the numerous participants who mobilised in defence of the Peruvian proposal, some declared themselves as leftist activists. They located the issue at hand in a politicised

force field of neoliberal globalisation. The existence of such groups in the campaign does not necessarily disprove the initial claim about a strong, apolitical current. What is noteworthy here is that the leftist activists worked side-by-side with avowedly apolitical hackers, as well as with people subscribing to opposing, libertarian beliefs. This inclusiveness conforms with Gabriella Coleman's observation about the 'political agnosticism' that she witnessed among free software developers working in the Debian project. She attributes the aloofness of hackers with respect to ideological differences to a strong meritocratic ethos. This ethos asserts that one must not let ideological prejudices foreclose a potentially better solution to the problem at hand (Coleman, 2004). Not only does this pragmatic attitude enable collaborations across ideological boundaries, it also facilitates partnerships between the free software community and the for-profit sector (Lin, 2006; West and O'Mahony, 2008).

Thereby I do not wish to give the impression that hackers coexist peacefully in a milieu of heightened tolerance. Although such an 'anything goes' attitude had already been institutionalised with the Usenet from the 1980s and onwards, these ideas were themselves the outcome of innumerable micro-conflicts and struggles over how to define and govern the discussion forums on Usenet (Pfaffenberger, 1996). It is noteworthy that the most heavily publicised and long-winded dispute between hackers dealt with the extent to which politics should be played down in representations of hackers. I am referring to the now somewhat outmoded quarrel between the Free Software Foundation and the Open Source Initiative. Although the latter organisation has stagnated, the ideas and terminology which it introduced continue to hold sway over many hackers (Berry, 2004; Stallman, 2009). The centrality of this schism is suggested by that essentially the same questions are at stake in the internal split between hacklabs and hackerspaces (Maxigas, 2012).The disagreement, in addition to concerning differences over licensing schemes, focused on different uses of language. Adherents of the Open Source Initiative were closest to the image of technophilic engineers whose apolitical front rested on unacknowledged, liberal or libertarian, commonsensical opinions. In their advocacy of open source solutions they chose to foreground technical efficiency and economic benefits over political considerations. This strategy was succinctly captured by one of the front figures of the Open Source Initiative, Eric Raymond, when he told his adversaries in the Free Software Foundation to: 'Shut up and show them the code'. The message was that the quality of the code should speak for itself. Raymond did not fail to point out the tactical advantages of framing the issue in this way. The case for free/open source software would look stronger if it rested on technical merits rather than on contestable, ethical principles (Raymond, 1999b).

In fact, this last point resonates with the reservations that Richard Stallman raised against the attempts to legislate about free software in Peru (Chan, 2004). Perhaps, then, the quarrel between supporters of the Open Source Initiative and the Free Software Foundation has led to an overestimation of their differences in the academic literature. At the end of the day, both camps are embedded in and speak to the same recursive public. To make a compelling argument requires some reference to a taken-for-granted notion of technological progress as a social good (Berry, 2008a: 153). The gap between these two camps, on the one hand, and traditional social movements on the other, is likely to be more profound. In the past decade, politically schooled activists have joined ranks with hackers in the struggle over information freedom, state surveillance, and trade agreements preventing access to medicines, to mention but a handful of examples. This unison is acknowledged through the neologism 'hacktivism'. Nevertheless, discord has often arisen from such

encounters, as the politicised hackers and the activists have discovered that their reasons for engaging in politics differ (Coleman, 2003; Gunkel, 2005; Riemens, 2002).

Subsequently, when the Free Software Foundation stresses the political dimensions of having a free software licence, it carefully avoids positioning itself on the spectrum according to which political differences are usually measured, i.e. the left–right divide. The case for free software licences is said to be supported equally well under an anarcho-socialist flag as under a free market, pro-capitalist banner. This claim about being neutral in relation to the left and right divide hinges on the Free Software Foundation focusing on such issues around which there is a broad consensus between the left and the right in Western democracies. Crucially, a boundary must be drawn to isolate the question of intellectual property from the intrinsically related but thorny issue of private property (Söderberg & Adel, 2012). Issues falling on the right side of this boundary include freedom of speech, individual liberties and consumer rights. The indebtedness of this rhetoric to a liberal, American political tradition goes without saying.

After having made this point, Gabriella Coleman and Alex Golub add that the liberalism of hackers is rife with contradictions. It stands in a dialectical and critical relation to existing, liberal societies. Hence, it is an error of judgement to conclude from the above reasoning that hackers are necessarily complicit with the *status quo* (Coleman and Golub, 2008). My proposition is to extend Coleman and Golub's insight about the plasticity of the word 'liberalism'. The same observation can be made about another concept intimately associated with cyberpolitics, i.e. its susceptibility to technological determinist explanations of social change.

Vulgar Raymondism as historical materialism 2.0

Personal computers and the internet were introduced to a general public in the 1990s with much fanfare. Free market evangelism, technocratic fantasies and counter-cultural sentiments came together in a seductive vision of a better future (Johnson and Bimber, 2004; Kelly, 2009; Streeter, 2005). Some of the hopes attached to the internet were that e-governance would close the gap between representatives and voters; bureaucratic hierarchies would be flattened and replaced with networks; and authoritarian regimes in third world countries were expected to be destabilised due to the free flow of information (Agre, 2002; Howcroft, 1999). Although with less self-assurance, similar claims have been repeated with the rise of blogging, Web 2.0, Twitter, and so on. For instance, the protests in Iran in 2009, followed by the uprisings in Tunisia and Egypt in 2011, have been talked about as a 'Twitter revolution'. Underlying these presumptions is the myth about the coming of information society (Lovink, 2008; Mosco, 2004). Claims about an epochal change from industrialism to an information- and service-based economy have become something of a truism, but such talk is particularly prevalent among adherents of cyberpolitics (Kline, 2006; Liu, 2004). I wish to argue that part of the attraction of the myth of information society is that it can be called upon in the struggles of hackers against intellectual property, surveillance and censorship.

My argument relates to a famous essay written by Eric Raymond entitled 'The cathedral and the bazaar'. What interests me is not the validity of the statements made in this essay, so much as the extent to which the text expresses ideas prevalent among hackers.

The central claim made by Raymond is that software development tends to follow one of two logics: the cathedral or the bazaar. Proprietary software projects belong to the first category because their methods tend to be organised in a hierarchical and secretive manner. The bazaar model, on the other hand, is defined by the distribution of development work to a community of volunteers, the results of which are made public. The chief example hereof is the development of the Linux kernel. Raymond concluded his article by predicting that software projects abiding to the bazaar model were likely to eclipse cathedral-style development projects. Crucially, this was not dependent upon a mass mobilisation of hackers behind the higher moral principles of open source. It followed instead from the fact that 'the commercial world cannot win an evolutionary arms race with open-source communities that can put orders of magnitude more skilled time into a problem' (Raymond, 1998). The text quickly became an iconic point of reference among hackers. A small token hereof is that a widely exploited software tool for managing software development in a distributed manner has been named 'Bazaar' in homage to Raymond's article.

Along with widespread recognition came harsh criticism. Eric Raymond was accused of depicting open source development in an over-simplistic and self-congratulatory fashion. Of particular interest for my argument is a casual remark made by one of his critics, Nikolai Bezroukov. He noted a similarity between Raymond's style of argument and historical materialism. With reference to the latter, he dubbed the new version 'vulgar Raymondism' (Bezroukov, 1999). What Bezroukov had in mind when making his comparison was the version of historical materialism popularised by associates of the Second International. At the turn of the last century, this coalition of socialist parties was recognised as the heir to the Marxist tradition. Its members professed that history moves in a schematic, linear fashion from one stage to the next, propelled by the continuous, incremental development of the forces of production. The association with Marxism greatly offended Eric Raymond. In a response to Bezroukov he declared himself to be a firm supporter of the free market economy. He assured his readers that: 'open-source development and the post-industrial capitalism of the Information Age are natural allies' (Raymond, 1999a).

Thereby Eric Raymond hoped to have renounced any affiliation with Marxism. In fact, he unwittingly affirmed his indebtedness to historical materialism in the quote above. Scholars sceptical of claims about the coming of a post-industrial era have seen this notion as feeding off Marxist theory. Richard Barbrook has traced the connections of the early promoters of post-industrialism, most notably Daniel Bell, to American Trotskyism. After these writers had become disillusioned over the Soviet Union, they employed their familiarity with historical materialist theory in the American national interest. The notion of the coming of post-industrial society, later to metamorphose into visions of the information society, was devised as a grand narrative which could rival Marxism. According to Barbrook, the overriding goal was to present a different future scenario. World history would no longer culminate in socialism but in a global village of American consumer society (Barbrook, 2007).

Equally significant was the displacement of class struggle from the post-industrial storyline. It was the autonomous trajectory of technology, rather than human agency and social antagonisms, which was envisioned as the motor of history (Dyer-Witheford, 1999: 15ff). This reinterpretation of historical materialism refuted Marx's prediction

that capitalism would bring forth a polarisation of society into two warring classes. Indeed, the post-industrial vision grew out of an earlier idea from the 1950s about an end-of-ideology (Bell, 1961; Dahrendorf, 1959). This prophesied that class conflicts would diminish and ideological differences between socialism and liberalism would decline due to the material abundance of modern, industrial production. The rational redistribution of this wealth would be overseen by an enlightened elite of technocrats. For the first generation of post-industrialists, who wrote at a time when the star of Keynesianism was still ascending, technocracy was portrayed as superior to both socialism and *laissez-faire* liberalism (Bell, 1973; Drucker, 1950; for a critique: Webster, 2002). When the same ideas were picked up by a new generation in the 1990s, high-tech utopianism was wedded with free market evangelism, creating what Richard Barbrook and Andy Cameron have labelled a 'Californian ideology' (Barbrook and Cameron, 1996).

In latter-day accounts about the information society, Marxist theory has all but disappeared as an interlocutor. Nonetheless, a distinct Marxist flavour is betrayed by the claim about the rise of a networked mode of production. Allegedly, this new mode is on the verge of superseding the dominant, centralised mode of industrial production. This proposition also has a rather long pedigree. Starting with the first oil crisis, it has been repeatedly stated that organisational structures in the future will have to become more flat and flexible. This trend is typically attributed to the notion that hierarchical and stable bureaucracies will become increasingly costly in a world transformed by rapid, social and technical changes. Hence, Eric Raymond's binary distinction between cathedrals and bazaars was foreshadowed by an article in the 1970s making a similar argument. The traditional mode of designing organisations was likened to the construction of 'palaces', which was unfavourably compared to a newer mode constructing 'tents' (Hedberg et al., 1976). With the advent of the internet in the early 1990s, the same ideas were repackaged around the concept of the network. A seminal idea in this context was Walter Powell's notion of 'network firms'. He prophesied a future where networks would supersede firms as producers of wealth. The reason for this was that networks could arguably adapt faster and boast a sharper learning curve than traditional, hierarchical forms of organising production (Powell, 1991).

The key contribution made by Eric Raymond's article 'The cathedral and the bazaar' was that it located the hacker community at the centre of this larger current of thought. From then onwards, free and open source software development has invariably been the cornerstone in any argument about the rise of a networked mode of production. Perhaps the most scholarly work making such a case is Yochai Benkler's book *Wealth of Networks* (Benkler, 2006). His argument is supported by a large amount of empirical data and Benkler makes the obligatory caveats against technological determinism. Nevertheless, the central theme in Benkler's work is, as David Berry puts it in a review: '[a] shaky binary distinction between proprietary industrial forms of economic and technological structure and non-proprietary peer production models' (Berry, 2008b: 369). As with his predecessors, Benkler's reasoning builds on implicit assumptions that the networked mode of peer production is both more efficient and ethically superior to the outdated regime. The similarity between this reasoning and Marxist, historical materialism was not lost on the reviewer (Berry, 2008b: 369).

I have discussed the writings of Eric Raymond and Yochai Benkler as pointers to some popular ideas among hackers. In a study of activists involved in building wireless networks in Montréal, Serge Proulx draws a conclusion supporting the case I am trying to make here. The notion of the information society is a central point of reference among these activists. Proulx alerts his readers to the neoliberal origin of this concept. Having done so, he adds that the significance of this narrative is transformed in the hands of the activists. The fantasy of a frictionless market in information is transformed into a vision of an 'information-sharing society' (Proulx, 2009). This suggests how widespread opposition to the current intellectual property regime interlocks with an alternative version about the coming of the information society. According to this reinterpretation, the development of information technology does not point towards the triumph of technocratic governments and global markets. Instead, it holds out the promise of peer-to-peer decision-making, a digital gift economy, and the end of intellectual property monopolies (Barbrook, 2002; Moglen, 1999). There are strong parallels between this popular notion and some of the tenets held in mechanistic, historical materialist theory. The unlimited reproducibility of information made possible through computer technology (forces of production) has rendered copyright legislation (relations of production, superstructure) obsolete. Even the withering away of the nation state in cyberspace was predicted by some writers in the 1990s (for a critique see: Drezner, 2004; Sassen, 2000). The common feature of both of these narratives is the promise that the gradual perfection of man's technical mastery over nature will bring about a more humane future.

Critiques of technological determinism from Marxism to constructivism

Writers sceptical of the idea of the information society (Webster, 2002), as well as those criticising historical materialism (Giddens, 1995), converge in their rejection of technological determinism. Opposition to technological determinist thinking is shared by scholars from a wide range of academic traditions, from Marxist to constructivist. Underlying this shared rejection lies the concern that a technological determinist point of view is anti-democratic. This consensus might be misleading, though, since there is no agreement among scholars as to what constitutes technological determinism. A strict definition confines it to historical accounts where technology is seen as influencing the course of society without being influenced by social factors in turn (Bimber, 1994). Other scholars also see vestiges of technological determinism in writings acknowledging social and cultural factors while attributing a limited autonomy to technology. The first approach amounts to 'hard determinism' and the second may be called 'soft determinism' (Smith and Marx, 1994). My own sympathies in this debate are with those who advocate a more restrictive use of the term. I fear that with the looser notion of determinism, macro-historical approaches to technology can be tarred with a rather demeaning brushstroke.

What is at stake in this dispute over definitions is the continued relevance of Karl Marx's writings. Whether he was a technological determinist or not has been the subject of lengthy debates (Misa, 1988, 1994). As was mentioned above, both opponents and adherents of Marx have assumed that his concept of history was teleological. This interpretation was challenged for the first time in the wake of the Russian revolution,

most notably by Antonio Gramsci and George Lukacs (Reinfelder, 1980). While passages can be found in Marx's extensive writings indicating a technological determinist position, this is hard to sustain when his works are taken into consideration as a whole (Bimber, 1994: 94; MacKenzie, 1996: 26). Later-day philological research suggests that the notion of a unilinear, mechanistic history moving towards a telos owes more to Frederick Engel's editing of the manuscripts left behind after Marx's death (Carver, 1980, 1984). Engels diverged from Marx in his ambition to apply the dialectical method not only to man-made history but also to physics, chemistry and biology. After having asserted that a dialectical law of motion governed nature, Engels extrapolated from nature and claimed that history too moved in accordance with these laws (Engels, 1987). This taste for deterministic explanations was condoned by the writers associated with the Second International and became an article of faith for the early labour movement.

It is noteworthy that the revolt against technological deterministic explanations in the social sciences was led by Marxist or Marxist-inspired scholars studying the capitalist labour process. They saw how technological determinist reasoning served to obfuscate conflicts of interests at the workplace. For instance, Maxine Berg has argued that technological determinism was first promoted by the English bourgeoisie in the first half of the 19th century. They did so in response to growing resistance from the working class against the introduction of factory machinery. At this time, artisans and workers still believed that the juggernaut of mechanisation could be wrecked. Their resistance was countered in part through the contention that technological progress is an unstoppable, impersonal and ultimately benevolent force (Berg, 1980). The same arguments are being reproduced today in times of organisational change and downsizing. Paul Leonardi and Michele Jackson have examined the public statements made during two corporate mergers in the high-tech sector. These processes of restructuring were supported by technological deterministic assertions. Corporate managers found it expedient to portray themselves as being at the mercy of unyielding technological pressures. Acceptance of this line of argumentation rested on the general public already being accustomed to thinking of social change as dictated by technology (Leonardi and Jackson, 2004, 2009).

It was for this reason that Raymond Williams wanted to contest the popular perception of technology as a force located 'outside' of society. He feared that this fallacy would foreclose the possibility of taking democratically accountable decisions over the design and deployment of technology (Freedman, 2002; Williams, 1985). Arguably, the same conclusion was positively endorsed in Margaret Thatcher's famous acronym 'TINA', or 'There Is No Alternative'. By that she meant to say that there is no alternative to neoliberal reforms, globalisation and the rationalisation of industry (Bateman, 2002). I believe that the identification of this rhetoric with Thatcher's political agenda is what has convinced many social scientists of the necessity to oppose technological determinist points of view. This concern has been passed on to the current generation of constructivist science and technology studies (STS) scholars, even though not all of them share Williams' overtly leftist allegiance. Social scientists who otherwise regret the lack of political engagement in constructivist STS theory nevertheless approve of the emphasis it places on indeterminacy. As for example Andrew Feenberg concedes, 'In a society

where determinism stands guard on the frontiers of democracy, indeterminism is political' (Feenberg, 1999: 83).

Scholars of all hues have thus lined up behind a critique of technological determinism. Despite these sustained attacks, technological determinist explanations remain as compelling as ever to the general public (Winner, 1997). This persistence has convinced Sally Wyatt that the urge to debunk technological determinism is misguided. Evoking the symmetry principle in constructivist science and technology studies, she argues that rather than debunking technological determinist sentiments we should concentrate on asking what uses are made of such ideas and by whom (Wyatt, 2008). This outlook is consistent with the emphasis which constructivist STS theory otherwise places on the open-endedness of scientific truth claims and technical artefacts. As with these facts and artefacts, the technological determinist narrative and the birds-eye perspective of technocratic rule must be assumed to be equally susceptible to appropriation 'from below'. In other words, even the claim about determinism is itself underdetermined.

Technological determinism in the collective action framing of hackers

The proposition that technological determinist ideas have contributed to the mobilisation of hackers, can be further explored with a concept from social movement theory, namely that of 'collective action framing'. The term refers to how social movements construct narratives interpreting the world in a way that gives meaning to their struggles. Researchers working with the concept highlight the active role of social movements as producers of meaning. Thus, framing is understood as a process through which spaces of struggle are continually created, contested and transformed (Snow and Benford, 2000b; Snow et al., 1986). This emphasis on agency and fluidity has been presented as the main advantage of the concept over older theories of ideology. On the downside, the notion of collective action framings risks downplaying more deeply rooted currents of thought which could be better grasped within the structural approach of ideology critique. Indeed, the literature on collective action framing has been criticised for its relative neglect of how pre-existing cultures influence framing processes (Hart, 1996). Although it is a matter of dispute where framing ends and ideology begins, agreement has been reached that both approaches have something to offer. When they are combined, ideology can be seen as both a constraint and a resource in relation to framing processes (Oliver and Johnston, 2000; Snow and Benford, 2000a).

A valuable illustration of this is provided by Sveinung Sandberg's study of the Norwegian branch of the organisation Attac. The organisation came into existence with the surge of the alter-globalisation movement in the years around 2000 and its main demand is to introduce taxes on currency speculation. Although the organisation opposes neoliberalism, its rhetoric is coloured by the values of liberal globalisation. Representatives of Attac in Norway associate the organisation with newness, flexibility, pluralism, networks and so on. This kind of self-presentation was almost absent in France where Attac first emerged and where globalisation is seen in a more critical light. Sandberg argues that the initial, positive reception of Attac in Norway owed much to its adaptation to a more liberal strain in the country. Furthermore, he suggests that Attac lost its powers of

attraction when it became too closely associated with the traditional left. The subsequent marginalisation of Attac gives a hint of the limits of framing processes (Sandberg, 2006). In hindsight, I suspect that Attac's appropriation of the rhetoric about globalisation was somewhat half-hearted to begin with. As much is suggested by its best-known parole: 'Another world is possible'. Attac baulked at adopting one of the key tenets of their opponents, namely the assertion that there is no alternative. With a reference to the terminology introduced above, Attac failed to align their collective action frame to an ideology saturated with determinist convictions.

Attac's stress on indeterminacy can be contrasted with the deterministic convictions of the early workers' movement. The positive resolution of their struggles had been scientifically proven by the theorists of the Second International. Present-day Marxists have been untiring in opposing this interpretation of Marx. Their objections have only partly to do with philological shortcomings and inconsistencies in the argument, some of which were mentioned above. More demanding is the protestation that a teleological and mechanistic understanding of history is flawed on tactical grounds. It is feared that these ideas will supplant the role of class struggle in history and hinder political mobilisations (Dyer-Witheford, 1999: 48; Slater, 1980). Similar objections were raised already in the days of the Second International, stating that a deterministic concept of history would rule out the ability of humans to act. It can then be worthwhile to read how Georgi Plekhanov, a renowned defender of Marxist orthodoxy at the time, responded to this critique:

> Again, being conscious of the absolute inevitability of a given phenomenon can only increase the energy of a man who sympathises with it and who regards himself as one of the forces which called it into being. (Plekhanov, [1898] 1940: 19)

In subsequent paragraphs, Plekhanov pondered over the effects upon a person who disagrees with the given phenomenon. It is likely that their energy will be lessened by knowing that their resistance is futile, something which in turn will help to seal the inevitable outcome of the struggle. The reasoning by Plekhanov suggests that the deterministic interpretation of Marx, leaving aside its philological merits, might have been tactically sound. It is afterwards, I believe, that this way of reasoning has become problematic. The rhetoric about historical necessity backfired when communism could no longer make a credible claim for the future. Arguably, this was the chief accomplishment of the myth about the information society. As Richard Barbrook has demonstrated, this myth was designed to rival communism as society's utopic dream about the future (Barbrook, 2007).

When hackers take this myth on board as their collective action frame, they inherit similarly deterministic overtones as those which once animated the struggle of the labour movement. It is in this way that hackers have succeeded in aligning their collective action frame with the dominant ideology of TINA. Furthermore, in doing so, hackers have turned the tables on the talk about newness, creativity and openness which the post-industrial myth had bestowed upon managers and neoliberal reformers. The latter portray their opponents, defenders of 'old' labour and 'old' left, as relics soon to be swept aside by the forces of technology, globalisation and deindustrialisation (McChesney, 1999). When this rhetoric is appropriated by hackers, however, it is the

adversaries of cyberpolitics, intellectual property advocates and entrenched business monopolies, who are the 'dinosaurs' standing in the way of truly globalised, unleashed flows of information (Streeter, 2005).

The example set by hackers calls for a reconsideration of the critique of technological determinism. It is clear that, logically speaking, technological deterministic statements diminish the imagined space for collective action. However, the ideas and the practices of people often diverge, and this divergence can be politically productive. The assumption commonly held by social scientists that a belief in technological determinism rules out popular, political engagement is convincing because such a point of view has for a long time been associated with the interests of powerful elites. As the history of the early labour movement demonstrates, however, this was not always the case. It is not obvious which side in a conflict can draw support from a deterministic narrative. What technological determinism determines is the freedom of manoeuvre of the political adversary. If a social movement can claim such a position in their collective action frame, then it might contribute to grassroots mobilisation. In fact, it is thinkable that such a framing of collective action offers a stronger political position than arguments maintaining that the world could always be otherwise. As much is suggested by the opposition of hackers against cathedral-like intellectual property monopolies, a struggle buttressed by the imagined inevitability and emancipatory force of information technology and decentralised computer networks.

Conclusions and suggestions for future research

It is in place to make two caveats about the overall argument advanced in this article. Firstly, although I have concentrated on how the information society narrative was appropriated by hackers, this is not to say that this rhetorical feat provides an exhaustive explanation for their political clout.It owes more to their ability to intervene in the development of computer technology, an ability preconditioned by the prevalence of free software and open standards. Secondly, the scholarly critique of technological determinist views is consistent with an older tradition of 'ideology critique'. When I problematise this stance, it might seem as if I subscribe to a third position which rejects ideology critique *tout court*. My belief, quite to the contrary, is that scholars have a role to play in scrutinising ideological presumptions, of which technological determinism is a major one. Taking a cue from the Frankfurt School and its notion of 'immanent critique', I have advocated an approach where hackers' faith in technological determinism is provisionally accepted. The inconsistencies of these accounts can then be explored 'from within', and the discrepancy between the ideas of hackers and their practices can be unravelled. Implicit in what has now been said is that such a critique cannot remain at the level of concepts. It must be tested against empirical research. An eminent example hereof is Tarleton Gillespie's study of engineers advocating an end-to-end internet architecture. By closely examining how this argument came about, Gillespie has shown how the political ideas of the engineers were rephrased as claims about technical efficiency and necessity. Such studies might demonstrate how established concepts, such as 'technological determinism' or 'technocracy', can be off the mark vis-a-vis actual practices, and how this mismatch is being put to use in the politics of hackers.

Acknowledgements

Funding

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Author biography

Johan Söderberg is a researcher at Laboratoire Techniques, Territoires et Sociétés (LATTS) and IFRIS at University of Paris-Est, Paris. He currently studies the emergence of open hardware development. Theoretically, he is indebted to critical theory, labour process theory, and cognitive approaches within social movement theory. For more information, please visit his website: www.johansoderberg.net