

The IT Revolution Reassessed Part One: Literature Review and Key Issues

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Mass surveillance is fundamental threat to human rights says European report (Harding, 2015).

Millions stolen as hackers hit banks (Yadron & Glazer, 2015).

We are moving into an era when 'smart' machines will have more and more influence on our lives (but) the moral economy of machines is not subject to oversight in the way that human bureaucracies are (Penny, 2017).

Introduction

Headlines such as those above demonstrate as well as any that the IT revolution brings with it a series of challenges that societies are ill prepared to face. While surprisingly large numbers of people unthinkingly renounce such of their privacy as remains for trifles, the idealistic hopes of early pioneers and freedom-loving 'netizens' remain largely unfulfilled. Benign notions such as 'cyber democracy' and the 'information superhighway' have all but disappeared. In place of these optimistic hopes and projections there's a growing sense of uncertainty, disillusion and, in some cases, fear. One reason for this is that for many the digital realm is an elusive and obscure 'nowhere place' whose shadowy operations lie beyond the boundaries of human perception. Another is that a few vast corporations, and those with privileged access to their services, appear to have almost unlimited influence both for good and for ill. What is striking, however, is that in order to capture attention and encourage wide immediate usage it's the presumed *utility* of emerging technologies that's highlighted rather than the *radical ambiguity* that attends their longer-term use. The implications of this gulf or fracture need to be more thoroughly understood if positive measures to reduce or eliminate them are to be undertaken.

Those driving various components of the IT revolution claim new benefits and highlight examples of successful implementation - email, tablets, health innovations and so on. Yet, despite these obvious successes, it's hard to avoid the fact that many IT practices are powerfully disposed in favour of the interests of corporations, innovators and entrepreneurs. Equally, there's little evidence that these actors are motivated by positive values that promote the public interest. So concerns that the overall effect the IT revolution may be to herald the onset of a humanly oppressive technological dystopia remain remarkably durable - if not always spelled out in detail (Harari, 2015). Consequently no amount of saturation marketing will cancel out the 'dark' side of the IT revolution or allow it to be wished out of existence. The collective subconscious runs deep and arguably has access to truths, archetypes, dimensions of reality, denied to, and by, high-tech gurus (Slaughter, 2012, 2015a). It knows, for example, that intangible entities can reach out and destroy centrifuges in a distant country, disrupt civil infrastructure, undermine organised life across the globe. It knows that private bank accounts can be drained before their owners realise what has

happened. It also knows that women are attacked and sometimes killed by former partners who've tracked their movements, their conversations, using smart phones and social media. Which leaves out a host of phishing attempts, scams, identity theft and other on-line abuses (Glenny 2011; Williams, 2015).

This enquiry takes the form of two separate but interrelated papers and has two main purposes. The first paper seeks to account for the underlying polarity outlined above between the promoters of high-tech 'solutions' and those who view the world differently. It draws on a small (but carefully chosen) sample of literature including informed (or 'quality') journalism. It begins by outlining key assumptions (including that technology is 'not merely stuff' and 'new technologies are ambiguous'). It then outlines aspects of the territory through a critical review several key works and suggests some working conclusions. The second paper is comprised of two more focused case studies: the Internet of Things (IoT) and current efforts to replace human drivers with autonomous vehicles (AV). It also draws lightly in Integral futures methods to provide a brief account of some of the interior aspects of three Internet giants. It concludes that a variety of actions, decisions and policies are needed to reduce high-tech ambiguity and greatly expand social equity. Such 'conclusions' should be regarded as starting points for further enquiry. Turning the IT revolution toward more productive and egalitarian ends will require dedicated social efforts that are sustained over the longer term.

Key assumptions

1 - Technology: not merely 'stuff'

A key insight that emerges from STS (Science, Technology and Society) perspectives is that we should not think, speak or refer to 'technology' as if we were merely dealing with an array of physical (or digital) objects. It is, of course, the material existence of a technology that presents itself to our most obvious and external senses. But taken alone such a view reifies what 'technology' actually is – the product of long-term social, cultural and economic processes. Hence many of the most significant characteristics of any particular technology are effectively invisible – both to the naked eye and the unprepared mind. They are not found by examining the 'things' (or software) that are displayed before us but by teasing out the patterns inherent in the causative relationships that brought them into being and maintain them over time. Thus to say anything of value about 'the IT revolution' or 'the Internet' suggests a need to consider particular items, or suites of technology, in relation their wider contexts. That's where the fun begins because as soon as you look 'beneath the surface' of social reality you find powerfully contested dynamics just about everywhere.

2 - New technologies are ambiguous yet warnings and costs are ignored

An underlying fact that's so common it's often overlooked is that *new technologies are, on the whole, seldom actively sought by anyone representing an existing public interest*. Rather, 'demand' is manufactured and propagated by powerful organisations through pervasive and relentless marketing across all

available media. The sheer financial and economic power at work here is breathtaking. One is reminded of the aphorism credited to Donella Meadows that you don't have to spend millions of dollars advertising something unless its worth is in doubt. Few stand back to question the fact that the corporations assume that they know what's best for everyone. Yet technical developments have always created 'winners' and 'losers.' So new technologies cannot *but* be fundamentally ambiguous unless great care is taken in the early stages or until sufficient time has passed for social experience to accumulate. While they are often introduced with showy fanfares that enumerate supposed benefits there are *always* hidden dangers and costs. For example, the ubiquitous rise of GPS devices has led to a marked decline in people's own ability to navigate. Again, commonly used 'phone numbers used to be memorised; now they are merely a click away and the memory fades. Most parents understand how technology alters things as basic as child rearing as they struggle to mediate between their children and the increasingly enticing attractions of 'screen time.' Then there are the 'lonely hearts' looking for love on the Internet and ending up seriously out of pocket or worse.

The rest of this article considers sources that deal with different aspects of the IT revolution. The literature is huge and growing so a work of this kind cannot be comprehensive; it therefore draws on an indicative sample.

Six views of the IT revolution

Big data, small vision

Mayer-Schonberger and Cukier's book *Big Data* (Mayer-Schonberger & Cukier, 2013), is sub-titled 'A revolution that will transform how we live, work and think.' But the irony – to say nothing of the threat – in this escapes them entirely. The bulk of the book is devoted to arguing how 'big data' provides new insights into many otherwise elusive phenomena and in so doing creating new sources of value. The authors demolish some fantasies (for example that the emergence of IT can be equated with the 'end of theory') but concentrate exclusively on positive uses of big data. These include the ability to predict the emergence of epidemics and the prevention of aircraft breakdowns due to real time engine monitoring.

But what they consistently fail to do is to separate what they consider to be 'good for business' from what may or may not be good for everyone else. Hence, the underlying theme, perhaps, can be summarised as 'jump aboard or be left behind.' But, while there are limited acknowledgements of ways that previous long-standing occupations and professions have been undermined, the wider costs are overlooked. There's a brief section on risks and strategies to minimise them. But no attention whatsoever is given to evaluating *the culture and worldview* from which these changes spring. Nor is there any attempt to consider or evaluate their future implications. Rather these powerful background factors are taken as given and hence remain invisible throughout. As such the book demonstrates a familiar preoccupation with how 'technology' will help us to 'create the future' along with a strong sense of blinkered optimism.

Missed opportunity

Lanier's *Who Owns The Future?* (Lanier, 2012), is a rather different matter. It is a sometimes brilliant, often idiosyncratic but finally a disappointing work, which is basically a missed opportunity. As a long time inhabitant of Silicon Valley Lanier has been involved in some of the early stages of the IT revolution. Yet as time passed he became uncomfortable with the growing power of the few and increasing social inequality. He coined the term 'siren servers' to draw attention to the humiliating process whereby everyone using the new systems is forced to yield personal information of inherent value in a one-way flow to those who own and operate them.

His solution, in part, is to establish the principle of 'provenance.' That is to monetise flows of micro-value that would enable individuals to share in the new wealth. Yet this is put forward without a careful examination of the kinds of perverse incentives (such as 'badging', 'nudging' and 'gamification' – see Morozov 2013, below) that are already evident in this fast moving domain. Unfortunately, however, while there's a good deal of knowledge and passion driving the book, the pro-technology bias vitiates what might have been a valuable piece of work. Similarly, the author's very close proximity to Silicon Valley and his inability to tease out some of the ideological ramifications make this book less helpful than it might otherwise have been. I, for one, had to put it aside several times. This was not because it was conceptually demanding but because it was too consistently idiosyncratic – brilliant one page, frustratingly obscure the next. In the end, I was unable to finish it. The fact that I was reading it as an eBook on a tablet did not help. Despite considerable efforts I found it impossible to sustain a 'conversation' with a book that I could not touch, inscribe or question as I went.

Reform and renewal

Taylor's *The People's Platform* (Taylor, 2014) is a breath of fresh air in a difficult and often demanding debate – one that you could argue is often obscured by the overwhelming self-interest of some of the most powerful entities in the world. With the subtitle 'taking back power and culture in the digital age' the reader knows at the outset that this will not be another banal enumeration of the purported 'wonders of IT.' For her, the mantra of 'open markets' is far from an unalloyed 'good' because 'the more open people's lives are, the more easily they can be tracked and exploited by private interests' (P. 23). At the outset I welcomed the author's clear acknowledgement of the way conventional discourse about IT is framed. It 'tends to make technology too central, granting agency to tools while sidestepping the thorny issue of the larger social structures in which we and our technologies are embedded' (p. 6). She adds 'first and foremost, we need to rethink how power operates in the post-broadcast era' and 'technology alone cannot deliver the cultural transformation we have been waiting for; instead we need to first understand and then address the underlying social and economic forces that shape it' (p. 9 & 10). The issues could not be put more plainly than that. The language and intent here also echo those of the STS

discourse mentioned above. Grounded approaches of this kind are essential for 'clearing the fog' and making sense of what is happening around us.

Later she points out how, far from promoting competition, monopolies prosper online bringing about a new kind of 'vertical integration' and power over people. A major contradiction, in her view is that 'the more customised and user friendly our computers and mobile devices are, the more connected we are to an extensive and opaque circuit of machines that coordinate and keep tabs on our activities' (p. 32). There are many other aspects of this informed and detailed critique. One of the most striking conclusions is simply that the future currently being fashioned, far from being innovative and 'new,' is in fact deeply conservative, even regressive. That is, it 'perpetuates and expands upon the defects of the earlier system instead of forging a new path' (p. 34). This is particularly the case with advertising. During earlier times it was little more than a kind of visual adjunct to shopping that simply drew attention to what was for sale. A century or so later it has become a vastly inflated, turbo-charged public nuisance. It not only embodies crass and indefensible conceptions of human existence ('shop 'til you drop') but also imposes incalculable costs on individuals, societies and cultures in part through misdirecting them wholesale and undermining useful (i.e. less self-focused) values.

As suggested above new technologies don't emerge in a cultural vacuum without social, political and economic influences. It follows that, 'if we want to see the fruits of technological innovation widely shared, it will require conscious effort and political struggle' (p. 54). What is also refreshing here is that the author is under no illusion that the main beneficiaries of IT innovations have indeed been American corporations. Given the worldview that these share it is obvious that something needs to give. For example, it becomes increasingly vital to contest the power of what Taylor calls 'the overlords of monopoly journalism' and the ways that they've become 'disconnected from the communities they were supposed to serve' (p. 78).

A great deal has been written and said about the rise and rise of 'social networks'. But few examine the ways that they quietly 'shuffle hierarchies' and produce 'new mechanisms of exclusion' (p. 108). Such media, it turns out, are by no means immune to what has been called the 'iron law of oligarchy.' Thus 'the web is not actually unstructured, despite the fact that it is open. (It) has a surprising degree of inequality built into its very architecture' (p. 121). Again 'the topology of our cultural landscape has long been twisted by an ever-shrinking number of corporations' (p. 129). She adds that 'powerful hierarchies have come to define the medium.' Moreover 'online spaces are ... contrived with specific outcomes in mind: they are designed to serve Silicon Valley venture capitalists who want a return on investment, and advertisers who want to sell us things' (p. 139). The smoothness and ease of use of the technology belies an appalling 'structural greed' such that 'the cultural commons have become little more than a radically discounted shopping mall (p. 166).

Some of the solutions – or at least necessities for creating positive change - that emerge from Taylor's well-founded critique include the following.

- The need for new social protocols that include 'ethical guidelines for engagement and exchange, restrictions on privatising and freeloading, fair compensation and the fostering of an ethos of stewardship.
- An explicit recognition of the need to acknowledge the people and resources of all kinds upon which IT systems rest. These include, rare minerals, mines, data centres, toxic waste, low paid factory workers and the growing mountains of e-waste that turn up in poor countries.
- A serious attempt to define just how IT systems could be re-designed to better serve the public and also ensure that they are sustainable.
- A strategy to withdraw from the current practice of commodifying and monetising the attention of IT users and expropriating their personal information for profit. That is ending 'a new form of discrimination ... led by companies you can't see, using data you didn't give them permission to access, dictating what you are exposed to and on what terms' (p. 191).
- Defining and enacting new national policies to rein in the worst excesses of the IT industry and, at the same time, protect people and cultural spaces where creativity, art and innovation occur for non-instrumental purposes.
- Reducing the colossal amount of resources expended on advertising (over US\$700 billion a year in the US alone) which is something that has virtually no social value and that most people despise.

As a way of bringing these ideas together, Taylor proposes a 'manifesto for a sustainable culture'; one in which 'new and old media are not separate provinces but part of a hybrid cultural ecosystem that includes the tradition and digital composites of the two' (p. 215). In her view such a culture will possibly include the following features.

- It will balance a preoccupation with 'nowness' with encouragements to think long term. As such it will include building archives 'to allow people to explore their cultural heritage for years to come.'
- It will 'harness new communications tools to shift the conversation from 'free' culture to 'fair' culture.
- It will re-draw the boundaries for subsidies that currently go to the powerful and make them more widely available for genuine useful civic purposes.
- Current Internet oligarchs will give way to new civic organisations such as a 'digital public library.' The former would, at the same time, be required to pay their fair share of tax.
- Service providers and popular IT platforms will be regulated as public utilities. As part of this new 'firewalls' would be created to separate those entities that *create* information from those that *transport* it. In other words, the 'vertical integration' of the oligarchs would be reduced and eliminated over time.
- Similarly, meaningful government oversight of digital media will be re-established.

- New investment in non-commercial enterprises will be evaluated and encouraged.
- Overall, art, culture and commerce will be freed from being monetised, commodified and relentlessly exploited (215-32).

These are clearly the kinds of suggestions that will in some places generate familiar accusations of 'Socialism' and the like. Yet without taking such proposals seriously it is difficult to imagine how the present trajectory of global civilisation can be turned around.

The dark side

Thus far we've considered sources dealing with some of the social and commercial uses or misuses of advanced IT. But there's an even darker and yet more challenging side to this story - the military and criminal uses of IT that have emerged over the last couple of decades. The questions they pose are of the utmost significance to humanity and its possible futures but, again, too few appear currently willing or able to grapple with the issues, let alone provide satisfying answers. Given the secrecy and obscurity that characterises the area, reliable sources are few and far between. An exception is Misha Glenny's 2009 book *McMafia* (Glenny, 2009) which provides a detailed overview of organised crime around the world. In that book he showed how the advent of the Internet was a boon for criminals since it made their activities easier and that of governments and other civil authorities harder. That is because the Internet provides an ever-growing number of ways to hide, launder money and pursue a vast range of criminal activities in ways that are difficult to detect or deter.

Glenny spent the next two years researching and writing a book on cybercrime called *Dark Market* (Glenny, 2011). Here he concentrates on the emergence of individuals and groups who were all-too-ready to capitalise on the new opportunities to steal from unsuspecting organisations and individuals. For example he describes how the emergence of 'carding' began when hackers discovered how to access personal information and use it to withdraw funds from unsuspecting banks. This rapidly morphed into the development and online sale of card skimming devices, the duplication of credit cards and so on. An online presence called CarderPlanet facilitated this underground trade for some time by operating out of the 'Dark Net' of hidden sites that require special software for access. Nowadays its successors facilitate a vast network of illegal transactions that appear to cover the entire gamut of criminal activity around the world. Glenny follows some of the individuals who developed and pursued this parasitic underground trade and found that many of them came from Ukraine and other parts of the Russian Federation. But, of course, it did not stop there.

As all Internet users know to their cost the rise of spam quickly began to infest email communications. It was spewed out in vast quantities that required very few hits to make the exercise worthwhile. The Nigerian 419 up-front or money transfer scam was one of many that began to separate the naïve and vulnerable from their hard-earned cash. This, unfortunately, is a game that continues to grow and for which there are no simple or easy solutions. The rise of 'phishing'

and the exploitation of human weaknesses continue to degrade the web and take it ever further away from the idealism expressed by many of its early promoters. It's also the case that certain well-meaning groups (sometimes referred to as 'white hat hackers') trawl the Internet continuously to detect ISPs (Internet Service Providers) that support such illegal activities. But, as Glenny notes, it is an unequal struggle since 'there are tens of thousands of active cyber criminals out in the ether, and only a tiny fraction of them are every likely to get caught' (p. 151). At the same time, nasty as these criminal operations undoubtedly are, they are still relatively minor when compared to the growing use of the Internet for industrial espionage and military-style action.

Often cited here is the well-known case of the Stuxnet virus that was specifically designed to destroy centrifuges used by Iran for uranium enrichment. The virus is widely thought to have been a collaborative project carried out by the USA and Israel. The immediate end of disrupting the enrichment process for a period of time was apparently achieved. But informed observers also point out that this dangerous piece of military software has many other uses and potentially unlimited targets. Here the two-edged sword aspect of new technology is again clearly revealed. What was originally touted as a 'solution' to a particular 'problem' becomes a vastly magnified 'problem' (if that is the appropriate word) in its own right with consequences that are, to a considerable degree, unknowable. The very same dynamic re-occurred in Syria in early 2017 with drones being used against the 'liberating' forces. Glenny's book was written out of a concern that 'in humanity's relentless drive for convenience and economic growth, we have developed a dangerous level of dependency on networked systems in a very short space of time' (p. 1). Yet none of this appears to be deterring the corporates and Internet oligarchs from pressing onward and promoting new digital capabilities - including what is now being called the 'Internet of Things.' (This question is explored in more depth in the second of these articles.)

At the end of his book Glenny refrains from suggesting solutions because, frankly, he does not see many emerging. He notes, for example, that the resources being poured into 'cyber security' are, by and large, being invested in technology. Here is another reflection of the structural bias that is occurring more generally across a wide span of innovations. By contrast, 'there is virtually no investment in trying to ascertain who is hacking and why.' He adds that 'nobody differentiates between the hackers from Wikileaks, from the American or Chinese military, from criminal syndicates and from the simply curious' (p.268). It's important, in his view to develop a more detailed and sophisticated understanding of the hackers themselves. A thumbnail sketch suggests that most of them are male, bright (often in possession of advanced degrees), socially withdrawn and have had problems with family, especially parents. These attributes bring to mind those attributed by Joel Bakan and others to the corporation itself some years ago. That work concluded that the behaviour of some corporations could legitimately be considered psychotic (Bakan, 2003).

Glenny's work provides a valuable source of knowledge and understanding about the widespread criminality of our times and also the extent to which it is

supported and facilitated by IT in general and the Internet in particular. These are positive gains. But we turn now to one individual who has seen even further into the world of IT than this.

Interrogating net delusions

The works considered thus far have each tackled aspects of the IT revolution in fairly straightforward ways. They amount to what can be regarded as a ‘first wave’ of critique in that they deal with fairly obvious topics and employ quite straightforward thinking and analysis. Few or none have related IT and its many extensions to other existing frameworks of knowledge and meaning-making in any depth. Nor have they accessed wider and deeper narratives that bring into focus the wider threats to our over-extended civilisation (Ehrlich & Ehrlich, 2013). Evgeny Morozov is a relatively recent and qualitatively distinctive voice in the conversation that qualifies as perhaps the first of a ‘second wave’ contribution. His two books *The Net Delusion* (Morozov, 2011) and *To Save Everything Click Here* (Morozov, 2013) set new critical standards, break new ground and bring into play an impressive range of cultural and linguistic resources. In this brief overview we concentrate on the second and most recent of these.

What immediately sets Morozov apart from most other observers is that, rather than pick off this or that particular target, he ‘interrogates the intellectual foundations of the cybertheorists.’ Thus, according to a Guardian review he finds that ‘often, they have cherry-picked ideas from the scholarly literature that are at best highly controversial in their own fields’ (Poole, 2013). Morozov is critical not only of the means employed by the Internet oligarchs and Silicon Valley but also of *their ends*. The premise of *To Save Everything...* is that:

Silicon Valley’s quest to fit us all into a digital straightjacket by promoting efficiency, transparency, certitude, and perfection – and, by extension, eliminating their evil twins of friction, opacity, ambiguity and imperfection - will be prohibitively expensive in the long run. (Moreover) this high cost remains hidden from public view and will remain so as long as we, in our mindless pursuit of this silicon Eden, fail to radically question our infatuation with a set of technologies that are often lumped together under the deceptive label of “the internet” (Morozov, 2013 xiii - xiv).

The method employed here is ‘radical questioning’ and the author has a formidable grasp of what it takes to do so methodically and authoritatively. His arguments cannot be covered in detail as they need to be read and reflected on in the original. But we can summarise some of the language and conceptualisations employed as these can be regarded as powerfully enabling resources in their own right. The main themes of Morozov’s work address a number of long neglected topics including:

- Questioning the means and the ends (or purposes) of Silicon Valley’s quest.

- Rejecting what he calls ‘Internet centricism’ along with the ‘modern day Taylorism’ that it promotes.
- Opposing the rise of pervasive ‘information reductionism’ in many areas of life, culture, economic activity and so on.
- Questioning the fact that many apparently innovative procedures that are being promoted provide pseudo ‘solutions’ to problems that may not exist.
- Questioning the tendency of IT to reduce the viability of many socially grounded functions and activities – for example, causing entire professions and types of work (both repetitive and creative) redundant.
- Asserting the value of some of the human and social capacities that are undermined by IT. These include ambivalence, the capacity to make mistakes, the need for deliberative spaces and so on.

Morozov supports Taylor in reminding us that the dynamic that has shaped and is continuing to drive the Internet’s rapid growth and over-reach derives from *the never-ending search for profits* rather than any concern for human rights. In this view rights are everywhere being extinguished. The underlying dynamic is revealed in many different ways. It shows up in the supposed ‘neutrality’ of algorithms that, while ubiquitous, are hidden and inaccessible so far as most people and organisations are concerned. It also shows up in the vastly expanding realm of ‘apps’ that have hidden costs in terms of privacy, dependency and the promotion of questionable notions such as that of the ‘quantifiable self.’ (That is, a ‘self’ that can be tracked, measured, located, directed and ‘enhanced’ in real time.) Also involved here is a ‘quantification fetish’ – the idea that more data is always better, always ‘objective’.

What this amounts to is a vast collective pressure on how people understand their world and how they operate within it. Already there is a costly ‘narrowing of vision’ and the a decline in the ‘narrative imagination.’ Morozov quotes Clay Johnson that ‘much as a poor diet gives us a variety of diseases, poor information diets give us new forms of ignorance’ (p. 282). Having done so he also critiques this view for portraying citizens as being too passive and hence unable to ‘dabble in complex matters of media reform and government policy’ (p. 284). Instead Morozov prefers Lippmann’s formulation of ‘multiple publics.’ These are seen as being ‘fluid, dynamic, and potentially fragile entities that don’t just discover issues of concern out ‘in nature’ but negotiate how such issues are to be defined and articulated; issues create publics as much as publics create issues’ (p. 287).

Morozov’s work confirms what some have suspected for some time - namely that that the apparent ‘success’ of Silicon Valley, its entrepreneurs and, of course, the Internet oligarchs, has arisen out of a flawed and increasingly risky foundation. That ‘success’ for example depends on:

- Profoundly inadequate understandings of human identity and life;
- Thin and unhelpful notions of how private and public realms arise, exist and remain viable;
- Equally thin and unhelpful views of core concepts such as ‘communication’ and ‘progress.’

- An overwhelming tendency to elevate 'technology' to a far higher ontological status than it deserves or can support.

One of the 'strands' of this multi-themed critique is the tendency of Internet promoters to forget that the kind of 'theory-free' approaches to knowledge and action that they've unconsciously adopted has a long and chequered history. It also reflects the tendency powerfully inscribed in American culture of setting theory and reflection aside in favour of action and innovation. This is certainly one of the most credible drivers of the 'GFC' meltdown. The fact is that those driving the 'Internet explosion' are 'venerating a God of their own creation and live in denial' of that fact (p. 357).

What Morozov seeks supports some of the suggestions put forward by observers such as Taylor and Glenny but also goes beyond them. He seeks *a broad-based oppositional movement that calls into question both the methods and the purposes of Silicon Valley*. Part of this is the conscious design and use of products that he calls 'transformational.' That is, products that, instead of hiding and obscuring relationships, dependencies, costs and the like, reveal them as *a condition of use*. An example would be an electronic device that provides tangible feedback about the sources, types and costs of the energy being used. Some of these examples are reminiscent of Tony Fry's attempts to counter what he calls 'de-futuring' by re-directing the evolution of the design professions (Fry, 2009). Such 'post-Internet' initiatives will encourage people to 'trace how these technologies are produced, what voices and ideologies are silenced in their production and dissemination, and how the marketing literature surrounding these technologies taps into the zeitgeist to make them look inevitable' (p. 356).

A further characteristic of this approach, it is suggested, is that 'it deflates the shallow and historically illiterate accounts that dominate so much of our technology debate and opens them to much more varied, rich and historically important experiences' (p. 357). Finally, Morozov is at pains to remind us that 'technology is not the enemy,' rather, 'our enemy is the romantic and revolutionary problem solver who lives within' (p. 358). This neatly turns the discussion back onto broader questions regarding the constitution of human needs, wants etc. This 'take away' message is strikingly similar to that set out in the *Biggest Wake-Up Call in History* (Slaughter, 2010).

Critique and transformation

Thus far we've considered works that focus primarily on IT, the Internet and associated matters. Rushkoff's approach differs in that his focus is not primarily on IT per se but the ways that society and business have unthinkingly extended industrial practices well beyond their use-by date, supercharged unsustainable growth and missed the most positive opportunities that arise from digitisation (Rushkoff, 2016). In his view industrial innovations operated over time to disconnect people from the value chains that their labour helped create. Today's monopoly platforms, supported by centralised currencies have taken this process to extremes. Hence, 'the digital landscape so effectively monopolises economic activity that most people have nothing left to be extracted.'

Consequently 'social media companies grow at the expense of their users' (p, 33-4). The process is also counterproductive because it leads to an unsustainable endgame, namely 'an economy based entirely on marketing and advertising' (p.36).

Rushkoff helpfully reminds us that Daniel Bell's earlier work on the 'information society' went well beyond purely technical issues. Among the latter's suggestions was that 'technical progress' should be balanced by what he called 'up-graded political institutions' (p. 53). Clearly that did not occur but many of Rushkoff's recommendations for dealing with 21st century problems do serve to refocus attention on institutional change and transformation. Moreover these are to be guided, in part, by what he calls a 'recovery of values.' The *modus operandi* of platform monopolies like Uber and Amazon is seen as detrimental since neither accept any obligation to uphold the public good. In fact both rose to prominence by destroying and replacing pre-existing industries (taxi firms and publishing). A way forward is, in his terminology, to 're-code' or reinvent the corporation - which is obviously easier said than done. The author does, however, make a strong case for creating what he calls 'steady-state enterprises through engaging strategies such as:

- Get over growth (focus on sustainable equilibrium);
- Take a hybrid approach (commercial and more 'distributed');
- Change shareholder mentality (addressing social and sustainability concerns);
- Shift to a new operating system (revise and re-design the corporation).

For Rushkoff the central flaw of 'runaway capitalism' is the notion that 'more profit equals more prosperity' whereas in his view 'non-profits' (such as Mozilla) may be better adapted for a digital future. The important thing is to 're-write the rules of the growth game itself' (p 121-3). Much of the rest of the book deals with the nature of money. He is particularly critical of the dominance of centralised currencies - which he regards as 'the core mechanism of the growth trap' - and insists that 'we can program money differently' (p. 132-8). One of his most original suggestions is that money should be optimised not for growth but for 'velocity.' He makes a strong case for using existing, and designing new, ways to 'slow' money down so that it can circulate more productively. Local area trading schemes (LETS) are one way to do this and, despite its 'brittleness,' emerging blockchain technology may be another.

Rushkoff then brings a key suggestion to the table when he writes that 'reprogramming money requires less digital technology than *digital thinking and purpose*' (p. 153, emphasis added). This is a crucial point that supports a central claim of this paper, namely that *the power of technology needs to be matched by the wider, broader, deeper powers of understanding and insight that are available* but sadly lacking in the culture of Silicon Valley (Slaughter, 2015a). For example in this context we need to consider what kinds of money (plural) are needed? Local currencies make sense in some places, virtual bartering systems ('free money') in others and co-operative currencies in still others. Equally the existing heavy trend toward monopoly platforms designed for growth and for humanly

extractive business methods can be replaced by what he calls 'platform cooperatives.' Models of the latter are said to already exist in Ecuador and in Spain's well-known Mondragon Collective.

At least two sets of forces appear to support Rushkoff's suggestions. One is the sheer dysfunctionality of an economic system built on growth, extraction and exploitation, a system that works for a shrinking minority. The other is the growing influence of positive values that depart from this increasingly risky and over-extended model and that suggest viable ways forward. Readers will likely have their own list of candidates but four mentioned here are: women's equality, integrative medicine, worker ownership and local currencies. Finally, he suggests that a 'genuinely digital, distributist business' would be defined by features such as the following. It would:

- amplify value creating from everywhere;
- obsolesce centralised monopolies;
- retrieve the values of the medieval marketplace (inexpensive exchange between peers); and, in the long run perhaps
- seek some sort of collective or spiritual awareness (p. 237-8).

In summary, what Rushkoff hopes to see is a wide range of social, organisational and related innovations that are *informed* by digital understanding but strongly oriented toward more productive human and social purposes.

Summary

Each of the above has contributed useful material to this review. Mayer-Schonberger and Cukier's *Big Data* (Mayer-Schonberger & Cukier, 2013) demonstrates some of the pitfalls of taking an overly one-sided view of something as powerful as big data. Used carefully, with restraint and effective oversight, it certainly has a variety of helpful uses. Used carelessly and in covert, dishonest ways, it readily becomes a tool of domination and control. Lanier's *Who Owns The Future?* (Lanier, 2012) offers a close-up view of the culture of Silicon Valley in its early stages of development. Such a view can perhaps help us understand how and why that particular arrangement of human, cultural and technical resources was formed and, perhaps, how it may be influenced over time. Taylor's *The People's Platform* (Taylor, 2014) offers a fresh way of looking at IT in general and a comprehensive list of 'desirable actions,' many of which could be readily undertaken where political and social will is forthcoming and enabled with appropriate organisational support.

Glenny's tour of the 'dark side' (Glenny, 2011) sheds light on a widely felt but often ignored or denied reality. That is, the human, organisational and technical means through which the integrity of the early Internet was compromised. It draws attention to the fact that technical arrangements draw life, significance, meaning, both positive and negative capabilities, from human traits and cultural values. It therefore again demonstrates that these wider, deeper factors - rather than servers and ISPs - powerfully affect the underlying foundations and operational structure of the Internet. Morozov's *To Save Everything Click Here*

(Morozov, 2013) arguably sets new critical standards and helps to create a more robust and capable discourse for dealing in depth with many of the issues raised here. He articulates a strong case for intelligent opposition to 'solutionism' and what might be called 'Internet-centricity.' As such his work provides a depth appreciation of the IT revolution at this critical stage and the need for ways of influencing it for the wider good.

Finally Rushkoff follows suit with other contributors by demonstrating how redundant values and skewed power relations create adverse outcomes when expressed through digital technologies such as monopoly platforms, related social media and mis-named 'sharing economies'. He also shows how, in their own terms, they lead to arid, self-defeating social and economic consequences. But, importantly, he also sees many positive opportunities. He demonstrates that other options can be envisaged, some of which already exist in one form or another. Alternatives emerge from adopting constructive values, 're-coding' organisations, developing new kinds of money and evolving new or renewed social and organisational forms. His work also serves to confirm the two assumptions as the head of this paper. He demonstrates the practical utility of perspectives that look beyond technologies as such to embrace richer worlds of significance and meaning.

Despite the power and wealth of dominant IT based Silicon Valley mega-corporations they may not be as durable as they seem. Despite their current success most will at some point have to confront the fact that they are founded on a worldview and a set of values derived from the most problematic and short-sighted form of economic organisation that has ever existed (Ramos, 2011; Ehrlich & Ehrlich, 2013; Klein, 2014). To retain legitimation such organisations deny or obscure the fact that present forms of neoliberal techno-capitalism are poorly adapted to human needs and the reality of planetary limits (Slaughter, 2015b). Certain core operating assumptions dictate the way the system operates and powerfully shape and condition many of its products and services. These include the 'freeing' of markets from effective oversight and government regulation, the pursuit of 'growth' as an unquestioned goal, viewing the natural world instrumentally as merely a set of resources for human transformation and use and diminished views of human beings as consumers or pawns. One result has been the concentration of wealth into the hands of ever fewer individuals and groups (Piketty, 2015). So this is a state of affairs that cannot continue indefinitely.

Conclusion

If human societies wish to protect the wellsprings of life, culture and meaning they will need to limit the wealth, power and reach of the Internet oligarchs. Collective courage and resolve will be required to re-frame 'the Internet' and free the ubiquitous algorithm from their grasp. Ways in which it can be re-designed for more respectful and constructive uses are already beginning to appear (Hodson, 2016). This is quite obviously not a case of rejecting 'technology' wholesale but, as several authors considered above have suggested, of locating it within *a broader frame of understanding and value*. The latter will

include 'the market' but not be dominated by its current reductive and out-dated economic framework. An indicative example of this could be the Tesla corporation that has, in some ways, started to disrupt the comfortable world of the internet oligarchs by beating them at their own game. While it participates in mainstream projects such as the 'self-driving car' and 'brain computer interfaces' it is also investing in distributed power storage solutions that are already proving attractive around the world because they help solve a real and urgent problem. This shows that size and wealth do not necessarily preclude the development and production of truly useful innovations.

It's worth emphasising, however, that values do indeed sit at the core of everything. One of the most constructive options is therefore to understand and acknowledge how different values manifest, where they 'fit', so to speak, and how they are expressed in different environments. Hence the second paper suggests that greater insight into values precedes effective action (Wilber, 2017; Slaughter 2012). The topic cannot be pursued further here but it does, however, bring to mind a worldview in which technologies have been subordinated to consciously chosen values. That is, the culture of the Kesh richly evoked by Ursula le Guin in *Always Coming Home* (le Guin, 1986). Here the uses of high technology are certainly acknowledged but also known to be dangerous. The solution adopted by the Kesh is that advanced technologies are treated with care. They are partitioned off into specific locations where they can be used as needed but where their influence is kept in check. Rather than pursue technical power wherever its owners and inherent tendencies may lead, the Kesh chose to bring ritual and meaning into the heart of their culture. We would do well to remember this example and to draw inspiration from it. Although embodied in fiction it carries a vital message to our own time and culture.

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