Risk, Innovation, and Democracy in the Digital Economy

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Abstract

The study of digital economies and the sociology of risk have, with few exceptions, a relationship of benign mutual neglect despite possible important connections between the two. This paper aims to bridge the gap between these two fields through utilizing Beck’s theory of risk society to explore how the digital economy’s momentum of innovation is generating risks and limiting the scope of existing democratic decision-making via the power of the digital economy to create social faits accomplis outside of democratic control. Three specific risks emerging from the dynamics of innovation of digital economies are discussed as vignettes to illustrate these developments: the remaking of interpersonal co-presence and solitary life; the growing threats of AI to intensify unemployment and inequality; and the impact on the environment of an ‘always on’ and ‘always upgrading’ digital communication ecosystem. With the gap between the potential and the actual use value of the digitalization of the infrastructure of life continuing to grow, this paper argues that a different relationship between digital innovation and private and public spheres needs to be established to protect the effectiveness of contemporary democracy.

Keywords: Ulrich Beck; Digital Economy; Momentum of Innovation; Risk Society; Scope of Democracy; Technological Elite
In the space of twenty-five years, between 1992 and 2017, the trajectory of digital economies has led to a massive set of changes in economic and social life. The intensification of the network externalities (Bowker, 2005: 112–13) and scalability (Manovich, 2001: 38) associated with digital social media platforms have led to the development of internet giants with massive in-built advantages, such as Facebook, Amazon, and Google (see van Dijck, 2013). Not only has internet access and mobile phone take-up exponentially increased (Castells et al., 2007); the two have become fused in a way that has transformed both social life and the economic opportunities and business models of many of the most successful corporations in the world. That two of the most valuable companies in the world, Google and Facebook, charge the vast majority of their users nothing, but rather turn their customers into their most valuable product suggests, at the very least, that the emergence of the digital economy has been associated with very significant changes.

Despite the significance of these transformations and the risks associated with many of these changes, the study of digital economies and the analytical resources of the sociology of risk continue to bypass each other (see Lupton, 2016). This is particularly unfortunate because in studying risks emerging from the digital economy, a more general problem that the sociology of risk faces also arises. This problem is that risk is not merely a term of art, but also a lived with concept that identifies a vast multitude of future possible harms. In fact, we face an infinite number of potential risks everyday (Douglas and Wildavsky, 1982). Consequently, without more general, theoretical approaches to digital risk, then pace Douglas and Wildavsky (1982) we may be left indiscriminately counting an infinite amount of risks, leaving society defenceless against those that genuinely matter to us (see also Douglas, 1985, 1992).

In moving forward to redress this problem, this paper attempts to, in a provisional manner, explore what insights the most developed sociology of risk approach to studying the
relationship between technological innovation and the generation of social risks, Beck’s risk society, has to offer to analyse contemporary digital economies. Looking specifically at Beck’s analysis of how the ‘momentum of innovation’ (Beck, 1999: 72) of contemporary science and industry is generating social \textit{faits accomplis} – which create social risks and short circuit democratic control over social material life – this paper explores the extent to which this framework can be applied to the risks and the shifts in private and public relations emerging from the contemporary digital economy. After having outlined Beck’s analysis of this momentum of innovation, and then critically reformulating this approach to innovation, this paper proceeds to identify three key, selected changes emerging from digital economies’ momentum of innovation that function as vignettes to exemplify how this momentum of innovation entails both risks and substantial shifts in private and public relationships.

These three risks are: the remaking of interpersonal co-presence and solitary life; the growing potential threats of revolutions in artificial intelligence (AI) to intensify unemployment and inequality; and the threat to the environment of an ‘always on’ and ‘always upgrading’ digital communication ecosystem. As this discussion shows, in each of these cases a particular configuration of capitalism, state, and science has led to a momentum of innovation that is constantly making social \textit{faits accomplis} in a manner that both escapes substantive democratic evaluation, and in many cases undermines the basis for adequate evaluation. As such, the digital economy not only poses specific social, material, and economic risks, but, as this paper argues, its trajectory of development also exhibits significant affinities with the environment (Beck, 1995) and finance (Authors, 2015), in which ‘society becomes a laboratory with nobody responsible for the outcomes of the experiments’ (Beck, 1998: 10).

This paper proceeds in four parts. First, Beck’s theorization of the politics of science and industry and the implications of its momentum of innovation for public and private
relations is briefly outlined. Second, Beck’s understanding of the momentum of innovation is critically reworked to better integrate neo-Marxist insights into his theorization of the private sources of legitimated, but non-democratic, social change and the impact of social interests on the specific momentum of innovation. Third, three key risks emerging from the momentum of innovation of digital economies are discussed to exemplify these relationships between the momentum of innovation, social risk, and democracy. Fourth, it is shown how the changes being driven by digital economies are generating novel shifts in the relationship between the private and the public while also illuminating how these shifts have strong affinities with the contemporary remaking of environmental and financial risk by contemporary configurations of science, business, and industry.

**Beck on the Politics of the Momentum of Innovation of Science and Industry**

In *Risk Society* (1992) Ulrich Beck powerfully developed an analysis of contemporary society which highlighted how the production of wealth was systematically connected to the production of risks. For many theorists, the value of Beck’s work on risk society depends on the legitimacy of the ‘epochal’ nature of Beck’s work and the question of whether contemporary society is fundamentally different *qua* risk than previous societies. Nevertheless, irrespective of the validity of the ‘risk society thesis’ (Mythen, 2007) of whether we are living in age of qualitatively ‘new risks’, or questions about the truth of his most widely noted claims about risk and inequality (see Mythen, 2005; Authors, 2013), it is still possible to derive significant value from Beck’s work. This paper proceeds to develop this insight by utilizing risk society as an *approach* to analysing the dynamics of contemporary social material life rather than as a *thesis* about a definite historical break. This section specifically seeks to extract from Beck’s work an analytical framework to identify relationships between contemporary technological innovation, the generation of risk,
and the restructuring of private and public relations that limit the scope of democratic decision-making. While the argument in this paper follows many of the main contours of Beck’s argument, significant amendments will be made to redress key lacunae in Beck’s formulation in the following section.

Underlying Beck’s grand theorization of the shift from first modernity to risk society (1992) and then world risk society (1999) is a more detailed, in fact, almost micro, analysis, of the politics of science and industry. In this analysis, Beck questions the existing ‘scientific rationality’ which is driving a ‘permanent large-scale experiment, requiring…involuntary human subjects’ with respect to existing levels of toxicity in society (Beck, 1992: 69). For Beck it is ‘a self-satisfied “techno-scientific rationality”’ that is ‘trapped in a narrow-minded belief in progress’ that provides the ideological support for these changes (Beck, 1992: 58). Building on this, he notes with respect to critiques of this techno-scientific rationality, that ‘in the eyes of the technological elite, the majority of the public still behave like engineering students in their first semester’ (Beck, 1992: 58, emphasis added). For Beck, the dominance of this techno-scientific rationality (which is an advanced form of instrumental rationality), does not merely provide more technical affordances or opportunities; rather ‘Along with the growing capacity of technical options [Zweckrationalität] grows the incalculability of their consequences’ (Beck, 1992: 22, original emphasis). Specifically the consequences lead to us ‘living in an age of side-effects’, in which systemic side effects emerge from the out of control ‘momentum of innovation’ of science and industry (Beck, 1999: 72).

Fundamental to the dynamics of innovation and its highly opaque consequences is the extreme division of responsibility and the exclusion of the public from the technical details of the processes producing these risks in science and industry (Beck, 1992: 76). This exclusion of democratic control over the details of scientific and industrial innovation leads to a ‘structure of (ir)responsibilities in the relationship between business, politics and the
These structures of irresponsibility in science and industry enable the use of their ‘accumulated privileges to create *faits accomplis*’ that continue to be ‘shielded behind the optimistic promises of progress’ (Beck, 1992: 234). In theorizing these shifts from rigid structures to more fluid networks that provide even less friction on techno-economic driven change (see Beck, 1992: 220–2), Beck argues that this “progress” can be understood as *legitimate* social change *without* democratic political legitimation’ (Beck, 1992: 214, original emphasis). Nevertheless, for Beck this latent, uncontrolled social change is creating massive risks and undermining the scope of democratic control:

> The ‘anarchy of side effects’ corresponds to a governmental policy which is only able to give its blessings to prescribed decisions, to an economy that leaves the social consequences in the latency of cost-intensifying factors, and to a science that introduces the process with the clear conscience of its theoretical attitude and wishes to remain oblivious of its consequences. (Beck, 1992: 214)

As such, for Beck, ordinary citizens must protect democracy against it constantly being undermined by the side-effects of innovation driven by the existing *technological elite*.

Beck’s theory of techno-scientific development is then not merely a theory of risk production, but also an analysis of the conditions of democratic control over social life. As Beck argues, ‘Business, science and the like can no longer act as if they were not doing what they are doing, that is, changing the conditions of social life and hence making policy *by their own means*’ (Beck, 1992: 233, original emphasis). For Beck this ‘monopoly of technology becomes a monopoly on concealed social change’, which threatens the underlying preconditions of democracy in significant ways (Beck, 1999: 61). While Beck’s analysis of the politics of science and industry was originally formulated only with reference to environmental risks (1992), as the discussion above suggests, this framework has significant relevance to other spheres of life as well, which will be elaborated below. Yet, prior to pursuing this task, it is necessary to briefly critically evaluate Beck’s account of the
‘momentum of innovation’ in view of thirty years of theoretical and social learning since Beck’s original formulation in German of *Risk Society* (1992) in 1986.

**Critically Rethinking Beck on the Underlying Dynamics of Innovation**

In theorizing the relationship between the ‘momentum of innovation’ of science and industry and its latent impacts on political life *writ large*, Beck has made an important contribution. The question that emerges next though is: what is driving the ‘momentum of innovation’ of science and industry? This is where Beck’s account is less adequate, with him shifting between contradictory statements, to a later, more unsatisfactory formulation in his attempt to understand the contribution that different social forces make to generating contemporary risk.

As has been highlighted in a different context regarding the debate over the primary driver of globalization, modernity *or* capitalism (Ram, 2008: 7–8), Beck likewise manifests a certain ambivalence over whether risk society is simply an additional stage in the development of modernity (Beck, 1992: 9–11) or whether it is a particular *capitalist* variant of modernity that plays a key role in the underlying forces driving the velocity and direction of innovation. While Beck sometimes declares that the risks of risk society are a side-effect of the production of wealth (Beck, 1992: 19), his primary emphasis in *Risk Society* as a whole is that these risks are a side-effect of modernization (Beck, 1992: 27). This latter interpretation he further supports by declaring the incompatibility and competition of the ‘logics’ of distribution of wealth and risk (Beck, 1992: 154). This neglect of the role of capitalism in shaping the production of contemporary risks in *Risk Society* (1992) has been previously noted (Rustin, 1994; Benton, 1997). Yet, his later work on risk (Beck, 1999, 2009), unfortunately, further distanced himself from tackling how the capitalist institutionalization of profit as the directing aim of market production and the necessity of ‘expanded reproduction’ of capital shapes existing dynamics of innovation. Ultimately, Beck
came to see modernization *en bloc* as the driving force, with him recommending that modernization be understood ‘as a process which has become autonomous’ (Beck, 1999: 72).

In developing this account of the processes driving modernization and innovation, Beck focuses on the primacy of a type of instrumental rationalization process that is not necessarily specific to capitalism. This instrumental rationalization, specifically ‘techno-scientific rationalization’, is powerfully reminiscent of the Weberian thread in first generation Frankfurt School Critical Theory. In particular, Beck appears to push to the extreme a trend in early critical theory which follows Weber in seeing modern society, both capitalist and socialist, as importantly equivalent in the sense that they are both increasingly ‘totalitarian’, unfree societies due to the dominance of instrumental rationalization.9 Yet, in response to this equivalence, it might be said, that even if both types of societies do threaten freedom in important ways associated with systemic instrumental or ‘technological’ rationalization, these societies will likewise differ in many ways worthy of further analysis.10

In thinking about how to redress Beck’s tendency to treat the momentum of innovation as a kind of *deus ex machina* based on technological scientific rationality, it is instructive to explore the underlying neo-Marxist insights of Beck’s work. It has been previously noted the extent to which Beck’s basic risk society problematic and some of his key strategies to address this problematic have strong affinities to Marx’s (even if his actual conclusions differ significantly) (see Authors 2016b). Yet, the powerful affinity of Beck’s work on the politics of knowledge to the Early Marx has not yet been directly addressed in the existing literature. In theorizing how science and industry have developed autonomous, internal trajectories that have enormous impacts on public life independently of democratic decision-making, Beck applied in an innovative way, the analysis that Marx developed in *On the Jewish Question* (1975a [1843]). In this early work (alongside Marx, (1975b [1843–4]), it is clear that Marx is not rejecting the democratic impetus at the heart of the French
Revolution, but rather critiquing how its limited scope actually undermines its aims. Insofar as democracy is purely political democracy, then any control over everyday, practical life is abandoned to private control: ‘the perfection of the idealism of the state was at the same time the perfection of the materialism of civil society’ such that ‘political emancipation was at the same time the emancipation of civil society from politics’ (Marx, 1975a [1843]: 233, emphasis added). The result was formal, heavenly democracy that abandoned control over the messy and mundane actual world. Marx applied this analysis to how the autonomy of private property led to alienation and exploitation in the economic sphere, while Beck innovatively extended this analysis to show how the de-politicalization of techno-scientific development is increasingly rendering democracy formal and empty of actual control over social life, while also massively increasing social risks (Beck, 1992).

Yet it is necessary to rework Beck’s politics of knowledge to rectify his neglect of Marx’s focus on the importance of power and social interests. Consequently, in explicating the underlying conditions driving our existing momentum of innovation, it is necessary to situate scientific and technological knowledge within the social material context that is shaping the motivations of the private actors driving these changes. In this case, as Marx emphasizes, the social use of any knowledge and technology cannot be analysed only through its use value, but also must be viewed through its exchange value (Marx, 1976 [1867]). Insofar as individuals and institutions are required to generate adequate exchange values (either profits for corporations or demonstration of contribution to market values, such as GDP, for governments), then we cannot understand the direction in which existing scientific and technological knowledge is developed or the use of this knowledge, without being attuned to the dynamics of exchange value and use value. Simply put, economic reproduction requires at least a certain level of satisfaction of exchange value, and in a context over the last four decades of heightened competition and intensified innovation to achieve competitive
advantages in terms of profits and elite pay (Glyn, 2006), the influence on the momentum of innovation of this competitive system of amplifying exchange value to maximize profits needs to be integrated into a theorization of the political economy of knowledge in contemporary digital economies. Consequently, contemporary digital economies should not be analysed as being driven by modernity and techno-scientific rationality en bloc, but rather as systemically shaped by a context in which the development and use of technological knowledge is heavily shaped by the aim of incessantly increasing exchange value as a means of maximizing profit. Having now developed a framework to analyse the relationship between the dynamics of innovation in science and industry and its impacts on the public sphere, this paper will address some of the risks emerging from the dynamics of innovation of contemporary digital economies.

**Risks and Digital Economy’s Momentum of Innovation**

This section discusses three risks as vignettes to illustrate how contemporary digital economies function as akin to the making of public policy by private means. These risks are: the remaking of interpersonal co-presence and solitary life; the growing potential threats of revolutions in AI to intensify unemployment and inequality; and the threat to the environment of an ‘always on’ and ‘always upgrading’ digital communication ecosystem. The purpose of this section is not to provide an all-things-considered evaluation of the contribution of the digital economy to human welfare; rather it is to illuminate key latent connections between the dynamics of innovation of the digital economy, social risk, and the scope of democratic decision-making.

*Digital economy and the remaking of co-presence and solitude*

How the digital economy ecosystem has been articulated over the last decade has begun to generate increasing concerns about the impacts of the use of networked communication
devices on social interaction and, correspondingly, on how individuals are pursuing tasks independently.\textsuperscript{16} As mentioned above, this is not a question of the impact of the growing use of the internet as a generic technology, but rather about its articulation within the particular dynamics of the digital economy that has evolved, in particular since the turn of the century, of the increasing dominance of massive internet platforms that do not charge their primary users for their services. Larger technological transformations in media, brilliantly and elusively tackled by McLuhan (1962), or alternatively described in terms of the shift from print culture to screen culture (Hassan, 2008: 183), are unquestionably important, but this paper has an alternative aim; its purpose is to analyse the implications for risk and democracy emerging from contemporary configurations of the emerging digital economy.\textsuperscript{17}

In the context of a business model in which customers primarily pay for the use of digital products with ‘eyeball time’, digital platforms have been designed to keep individuals directly using and networked as much as possible (Harris in Pittis, 2016). In paying in ‘eyeball time’ in the digital medium which already intensifies the shift from continuous to a multitude of discrete processes that imitate the continuous (Manovich, 2001: 50–4), this has increasingly led to networked sociality through incessant and immediate ‘clicks’ and clicked replies. In this context, risks are posed to both pre-existing forms of social interaction and forms of solitary activities from the shifts in co-presence associated with this conjuncture of the digital economy in the early twenty-first century, which is often called Web 2.0 (see Van Dijck and Nieborg, 2009).\textsuperscript{18}

As many different studies have highlighted, co-presence has been transformed through the proliferation and widespread, incessant, and intensified speed of use of digital media platforms for means of communication (see Hassan, 2008). As many individuals check their various networked communication devices hundreds of times a day, which bleeds into the time they are in the midst of face-to-face interaction with others, co-presence is
increasingly threatened with being transformed into being ‘Alone Together’ (Turkle, 2011). While these trends are mostly incipient – and hence exist primarily at the level of risks at this point – there are increasingly significant worries being articulated regarding how the increasing tendency of members to opt out via networked communication is negatively affecting the quality of conversation and empathy levels amongst heavy users of social media (Turkle, 2015). It needs to be emphasized here, digital economy forms of communication have not eliminated previous forms of valuable conversation. Yet, as Turkle (2015) indicates there is evidence that there are genuine threats to the quality of conversation: ‘we can find empathic conversations today, but the trend line is clear’ as young individuals increasingly go ‘elsewhere’ via social media while they are co-present with others.

Likewise, the platform framework of digital communications that is designed in a way to encourage constant communication, to have people always ‘elsewhere’, is increasingly threatening to transform ‘solitary action’ in a way that negatively impacts those tasks that are best achieved singularly. There are increasing concerns that the digital push towards constant interactivity across a variety of different platforms, driven by the articulation of the internet to maximize exchange value through clicks and maximal data extraction is producing suboptimal intellectual outcomes (see Carr, 2010; Hassan, 2012; Crary, 2013; Stiegler, 2015). In fact, there has been some research suggesting that associated with the new ‘clicked sociality’ are declining attention spans. A study by Microsoft indicated that between 2000, when the mobile revolution began, and 2015, the attention span of the average human being declined 33%, from 12 seconds to 8 seconds – though the implications of what this decline means continues to be heavily debated by Microsoft amongst others (Watson, 2015).

In thinking further about the potential impacts of this momentum of innovation of the digital economy driven by the pursuit of exchange value, Bernard Stiegler (2015) provides a particularly stark picture of the effect on cognition of recent shifts in the digital economy. For
Stiegler (2015: 23), the current conjuncture of the media industries, building on their successes in the television age, captures attention then to destroy it. Tracing this process back to the intensification of the industrialization and commercialization, in particular consumerization, of the basic technologies that constitute our social memory (through their role of publishing information), Stiegler (2015: 39) argues that consumer capitalism in the digital age is constantly creating shocks with massive social and cognitive damages. Pursuing a creative rethinking of phenomenology, Stiegler argues that particular forms of attention (ways of ‘articulating retentions and protentions’) based on existing technics of communication are what constitutes reason as a capacity and that the ‘attention economy’ – where attention itself has become a constantly sought after commodity – is making the forming of the kind of attention necessary for knowledge increasingly difficult (Stiegler, 2015: 151–2). As such, for Stiegler, the current digital economy, dominated by consumerism, becomes increasingly one of dis-apprenticeship.

Following Stiegler’s analysis of what may be called, following Habermas (1987), the intensified ‘colonization’ of forms of attention in the digital economy by consumerism, this is not a totally new phenomena, but rather a further intensification in scope and depth of trends due to the emergence of the ‘attention economy’. As such, this discussion should not be construed as implying that the rise of the digital economy and Web 2.0 is a shift from the best of all worlds to the worst. Rather the discussion is intended to identify the emergence of significant risks to existing social ‘goods.’ Driven by the particular dynamics of innovation in which corporations continually extend their ability to convert social practices, at the most granular level, into potential commercial opportunities, corporations work to reshape these practices so as to maximize profit via their monopoly of design over the digital platforms used for these practices. While Beck’s analysis of the politics of contemporary innovation highlights the power of science and industry to make social faits accomplis, it is the bringing
of this analysis more closely into confrontation with Marx’s analysis of the specific power
dynamics and systemic orientations driving innovation in capitalist societies, as suggested
above, that illuminates the short-circuiting of democracy and intensification of social risk at
the heart of the contemporary dynamics of innovation.21

Growing potential threats of AI to intensify unemployment and inequality
The risk that this section addresses is that the emerging robotics and AI revolution will
intensify existing levels of inequality and unemployment. This discussion is partly
‘projective’ in that the potentially massive effects of AI on labour markets are still emerging.
Nevertheless, the AI and robotics revolution has begun to have significant impacts on
unemployment and inequality. While the hollowing out of manufacturing has been influenced
by outsourcing to other countries, the shift to robotics in many industries has played a
fundamental role in the decline in the share of manufacturing employees. To provide only
one example, while between 1980 and 2015 there was only a slight decline in steel
production in the UK of a few percent, employment levels have been in freefall, from almost
100,000 to approximately 20,000 by 2015 (Hollinger, 2016a). More generally, it has recently
been suggested that of the 5.6m factory jobs lost in the US in 2001–10, 85% of these were
largely due to automation (Waters, 2017). Moreover, there has been a stagnation of wages of
uneducated workers over the last few decades, with the massive decline of semi-skilled
manufacturing jobs playing a significant role in growing inequality (Mishel, Bernstein and
Shierholz, 2009). This economic decline though has had impacts well beyond declines in
relative earnings and increases in unemployment. Recent research has shown that the same
demographic that has experienced increasing unemployment and inequality, less educated
white men in the US 25–54 years of age, have recently seen an increase in their mortality
rates (Kolata and Cohen, 2016). The decline in life expectancy of this age group – the first in
the US since records began – has been clearly associated with the consequences of social and economic isolation from the rest of society (Hayward in Kolata and Cohen, 2016).

Concerns are now increasingly being raised about whether existing, incipient trends in the dynamics of innovation of robotics and AI will soon lead to a significant ‘social, economic, and political disruption’ (Ford, 2016). These issues have only very recently begun to receive any significant attention, and at this point, it is easy to conclude that ‘We are completely unprepared for the robot revolution’ (Ford, 2016). The threat to jobs from AI extends to well beyond blue collar work to many types of white collar work. A recent study by Deloitte indicated that technology had already led to a reduction of 31,000 jobs within the law sector and that while highly skilled barristers and solicitors will see increasing benefits, jobs more closely associated with routine tasks, such as legal secretaries are at threat of seeing a decline of 114,000 jobs over the next two decades (Croft, 2016). With recent studies suggesting that robots are beginning to outperform human drivers (Bradshaw, 2016), and even human surgeons (Cookson, 2016), and with the labour costs of robots a fraction of labour costs in the West, and even less than in China, there is very significant potential for large disruptions of existing labour markets (Hollinger, 2016b). As Srnicek and Williams (2015) argue, recent dynamics of automation as articulated within the capitalist economy are contributing towards a ‘crisis of work’, which is increasing surplus populations, precariatization, and inequality. Even defenders of ‘the rapid changes we are seeing in artificial intelligence’ allow for the fact that there will be very significant transformations in the labour market, which will require major shifts in redistributive policies if these changes are to be adequately managed (McAfee, 2016).

As during the ‘Great Moderation’ in finance of 2000–7, there is a kind of ex ante unreality about these risks. Given their complexity and systemic nature and their association with the production of desperately needed prosperity (despite historically record levels of
wealth in advanced economies) it is not clear when these risks will manifest damages, what they will be, or even if we have the means to adequately measure these novel risks. In this context the scope of government decision-making is primarily relegated to *ex post* cleaning up the mess and then *regulating for the last crisis*. Whether or not these risks from AI will manifest themselves in massive actual damages to the life chances of vast portions of the population or not is, at this point, unclear, but this does not make the risks any less real. In the way same that the massive systemic risk build up in Anglo-American banking systems in the middle of the first decade of the 2000s was real even if, *ex hypothesi*, the specific tipping points associated with the ‘repo market’ had been avoided (Gorton and Metrick, 2012), it still must be concluded that the risks associated with AI are clearly there in the same way that driving 200 miles an hour creates massive social risks even if in specific cases damages may not be caused.

*An ‘always on’ and ‘always upgrading’ digital ecosystem and the environment*

Given how emails often include a note at the bottom about saving the environment by not printing out messages, the *de facto* sense is in some ways that screen use, in contrast to print use, is environmentally friendly. While this brief section cannot provide an all-things-considered evaluation of the environmental impacts of the rise of the digital economy, this section will highlight some of the key environmental risks associated with the business model of ‘always on’ (Hassan 2008) and ‘always upgrading’ associated with this conjuncture of the digital economy.

The growing omnipresence of internet communication technologies (ICTs) powerfully presents itself as an ordinary, uneventful type of activity that is not usually associated with significant environmental impacts. In contrast, the massive increase in air travel over the last half century is much more clearly associated with significant environmental damage. Yet, recent research now suggests that ICT use is responsible for
approximately 2% of all greenhouse gas (GHG) emissions, which is roughly equivalent to the
total carbon footprint of the aviation industry (Walsh, 2014). Moreover, with expectations of
growth of approximately 60% over the course of 2014–19 in internet users and further
increases in the amount of data demands of existing users, the trajectory of the carbon
footprint of ICTs is set to further increase (Walsh, 2014). The widespread proliferation of
‘energy-guzzling’ smartphones has likewise played a key role in the further intensification of
energy demands of the new, emerging digital economy. A recent study indicated that a single
app, Facebook, is responsible for almost 20% of the battery life when used on Android
phones (Gibbs, 2016b). Additionally, given that the expected lifespan of use of smartphones
is significantly lower than less ‘smart’ electronic purchases due to the intensification of the
‘upgrading economy’, the overall environmental impact of smartphones over their life-cycle
is much greater than their already sizeable carbon footprint from electricity use (Suckling and
Lee, 2015). In this vein, the airline industry may declare that at least they do not get rid of
their old planes every 2 years to get newer versions. Yet, while, the debate over another
runway at Heathrow is massively politicized, the ‘quiet politics’ (Culpepper, 2011) of ICT
design and use and the associated acceleration in environmental impacts continues to reign
supreme. With the environmental impacts of an ‘always on’ and ‘always upgrading’
economy, as with the other risks discussed here, the specific dynamics of innovation within
digital economies are having massive public effects, and governments, at this point, are able
to do little more than respond in a largely ineffective ex post and ad hoc manner to the
massive public impacts of these innovations.

**Digital Economy Risks, and Policy by Private Means**

As should be clear by the discussion above, no one voted to systemically undermine some of
the key preconditions of effective conversation and solitary time, nor has anyone voted to
develop AI in a way that threatens millions of high quality jobs, nor to develop an ICT ecosystem that has as much of a carbon footprint as the aviation industry. The cumulative public consequences of the emerging digital economy are massive and continually growing, yet this power is a case of public policy by private and often ‘quiet’ means.

A key possible objection to this analysis of public policy by private means, associated with the contemporary *individualistic consumption imaginary*, is that these are the unintended outcomes of the cumulative actions of many individuals within the context of the digital economy and consequently since they are voluntary, they are in some significant sense democratic. Nevertheless, in response it may be said that the same could be said of many of the types of risks and pollution associated with industrial production that Beck discusses in *Risk Society* (1992). Many of these risks are associated with the design and production of goods that individuals ‘voluntarily’ consume. Yet, as Beck (1992) argues, insofar as technological details and design are monopolized by the *technological elite*, then there are real limits to the voluntariness and democratic nature of these changes. Voluntarily consuming the product as a designed totality does not entail a democratic endorsement of all features of its design or of the side-effects emerging from its consumption.

Networked communication within contemporary digital economies is dominated by only a few major companies. In particular, each separate function is subject to increasingly high monopolistic levels of control which would make many of the 19th century Robber Barons envious. Whether this task be the searching of online data *á la* Google, personal communication and presentation of self *á la* Facebook and its acquired subsidiaries, the distribution of professional information across large networks *á la* Twitter, or of job searching *á la* LinkedIn/Microsoft, in a world of complexity with time as one’s most scarce resource and of data-based economies of scale, there have been powerful first-mover advantages in the digital economy. In these cases, as with the dictatorship of design details
that Beck highlighted in terms of industry and pollution in modern life, the fact that individual agents agree to participate in the evolving electronic ecosystem so as to be able to continue to function in contemporary society does not support the idea that these systemic changes are genuinely democratic and substantively, rather than formally, voluntary.

In contexts of the monopolization of different functions associated with ICTs and their monopolization of the design of platforms to maximize corporate gain, there are massive power inequalities between these corporations and an individual consumer. Insofar as these digital economy giants achieve first-mover advantages in terms of monopolistic positioning, then we need to move beyond the *fait accompli* legitimation of these systemic shifts simply because most individual agents agree, in specific contexts, to use these products. Outside of public discussion, the government is left to *ex post* chase these changes in a context of the *reversal of the precautionary principle* – in which only when changes after the fact have been definitively shown to be damaging is it permissible to rule against them. In the context of private corporations who pursue maximal profit, even at the cost of massive social risk insofar as these risks are not internalized, this leads to a systemic intensification of social risk, which public policy can only address after the fact. These risks are not simply the random, unintended consequences, which are inevitable features of social life. Rather, by systematically shielding the design details of the digital economy from public debate and control while leading corporations constantly reshape them to maximize net exchange value, a *systemic* intensification of risk and diminution of democracy is being effected. Beck’s analysis of the quiet politics of innovation highlights the importance of the neglect of monopolization of design details; yet, overcoming his neglect of the political economy of capitalism by integrating the specific orientation of innovation towards maximization of net surplus exchange value enables the identification of the particular systemic fragility and inequality emerging from the digital economy. That is, *contra* Beck, the risks emerging from
the digital economy are not simply the product of a rapid momentum of innovation as the product of a generic instrumental rationalization process; rather they are inextricably linked to the systemic pursuit of profit through innovation.

In this context, there are significant affinities to contemporary finance, in which, pre-crisis, many powerful voices trumpeted the *de facto* equation of the private control and profit of a small elite from financial innovation with generalized public benefit, and where massive changes were made prior to democratic approval. Moreover, in finance as in the emerging digital economy, the astronomical increases in net exchange values associated with these innovations were not met with corresponding amplifications of the apparent use value of many of these innovations. This paper is not suggesting though that we must either accept or reject *en bloc* the contemporary digital economy, but rather the intention is to highlight how genuine democracy must extend beyond the choice between existing provided gadgets and brands (see Marcuse 1964), to the actual shaping and design of the templates with which individuals are being presented. The other option appears to be to simply accept the collateral damages of the digital juggernaut and its dynamics of innovation that are driven by an unquenchable, never-ceasing quest to maximize the profits (net surplus exchange value) of the digital services provided.

**Conclusion**

Re-envisioning risk society as a framework to identify important similarities in the logics of different configurations of science, industry, risk, and the scope of democratic decision-making may bring together risk studies and studies of digital economy in a way that can importantly illuminate both of these fields of study. The risk society framework, critically reworked to better integrate capitalism’s specificity as a system of innovation, can illuminate how dynamics of innovation are having systemic impacts on different areas of risk and
democratic control – from environment to finance to the intersection of digital and non-digital life. As discussions of the recent massive rise of High Frequency Trading (HFT), its socially wasteful competition to shave off microseconds in transaction speeds (Budish, Cramton, and Shim, 2015), and the systemic risks and inequalities associated with these changes suggest, the unrelenting private dictatorship over design of innovations continues to raise questions of risk and limited democracy in ever new forms. As with these other changes, HFT was a ‘quiet revolution’ in financial trading that transformed markets in less than a decade without public debate or prior governmental approval. It was ex post governmental approval of a fait accompli created by the fusion of science and industry in the search for maximal net exchange value. As Michael Lewis succinctly states, it was a revolution ‘Hidden in Plain Sight’ (Lewis, 2015: 8).

It is easier to be critical of this revolution in finance than of many of the developments in the digital economy because the immense build-up of risks in finance came to fruition in massive damages, and likewise did so in a way that is easy for society to comprehend and measure – the collapse of the exchange values and basic functioning of financial institutions around the world. Nevertheless, this greater critical orientation to finance has not led to significant changes in the design of high-frequency trading or the risks emerging from this financial trading model. The monopoly of financial and technological elites over the design of their products remains sacrosanct and in a world of growing speed, complexity, and market concentration of financial and technological corporations, systemic options beyond choosing between different gadgets and brands continues to be extremely difficult to achieve.

Insofar as the basic conditions of our social material lives are being restructured by the systemic side-effects on environment, finance, and those aspects of life tied to the digital economy, in which isolated individuals cannot ‘opt out’ of these systemic changes, then the politics of knowledge and industry need to be rethought in a fundamental way. In thinking
about how science and industry need to be made more susceptible to democratic control, there is a clear need for both an extension of democracy to the economic sphere, but likewise also a rethinking of what economic democracy involves if these problems are to be addressed. Economic democracy has tended to focus on producer associations; yet, core to this critique of the emerging threads of the digital economy, risk, and democracy is to move beyond the individualistic consumer imaginary that prevents the collective action that is necessary to address these issues. Insofar as citizens qua consumers simply face a world of pre-formatted options, in which their options are highly circumscribed and systematically shaped by corporate aims of maximal extraction, then we have an extremely limited form of agency and democracy. Ultimately, this extension of economic democracy to consumption needs to protect the private dimension of life, while also reconceptualizing the private in other ways than as a *bona fide* sphere of property, in which individuals are fully sovereign and independent of each other (cf. Mill 1987 (1848)). While this is not simple in an age in which the institutionalization of individualization appears so omnipresent (see Beck 1992), nevertheless, finding a way to renew democracy is fundamental to addressing the dysfunctional amalgam of the momentum of innovation, failures of democracy, and growing social risk.

In surveying, finance, environment, and the digital economy, it is increasingly clear that we are proceeding through an age of multiple crises, fiscal, financial, environmental, and inequality crises (see respectively Gamble, 2014; Walby, 2015). The role of the state as increasingly an *ex post* bearer of excessive risks and the agent responsible for attempting to clean up private risk crises while respecting the *sovereignty of business* over its products and processes appears genuinely to be no longer sustainable. While this critical reworking of a theorization of risk society for the 21st century cannot at this time provide the answers to
these problems, in highlighting the affinities between these multiple crises, it nevertheless aims to make an important contribution in diagnosing the problems that we currently face.\textsuperscript{28}

Notes

\begin{enumerate}
\item Lupton (2016), along with van Loon (2002), are exceptions though that should be noted.
\item The Foucauldian inspired, governmentality approach to risk has also studied the development of technology, but its anti-realism about risk makes it unsuitable as a basis to study the relationship between technology and risks \textit{qua} the generation of actual future possible harms to society (see Ewald 1991; O’Malley 2008; Authors 2016a).
\item See Scott (2000), Strydom (2002), and Mythen (2005) for insightful discussions of this question.
\item In an early paper, Beck actually referred to ‘risk society’ as a ‘paradigm’, rather than a thesis (Beck, 1989), though his later work tends to re-interpret his earlier work in terms of a risk society thesis, or rather risk society ‘theses’ (Beck, 2009: 10).
\item Beck calls these consequences ‘incalculable’. While Beck’s totalization of epistemological opacity in this regard is an overstatement (see Authors, 2016a), the basic insight still holds true that these risks are often highly opaque because the public is excluded from the technical details of the means of producing the ‘good’ associated with the risk.
\item Which Beck later develops into a conception of ‘organized irresponsibility’ (see Beck, 1995) building on C.W Mills’ (1956) work.
\item The dilemma of accepting science and industry’s black-boxed output \textit{en bloc} or Luddism is one that Beck attempts to overcome with his conception of ‘reflexive scientization’, though it is not clear how successful he is in this regard (Beck, 1992: 158–65).
\end{enumerate}
managing the risks of risk society, though, ultimately, he still does not ascribe it as a cause of these risks.

9 See Adorno and Horkheimer’s (1979[1944]) and Marcuse (1964), ch. 2.

10 Adorno and Horkheimer’s (1979[1944]) analysis of ‘culture industry’ and Marcuse’s (1964) discussion of ‘false needs’ suggests that ultimately they did take this difference seriously despite their important equivalences between these types of societies.

11 In terms of noting further affinities, the solution for both was a radical type of democracy (Marx, 1975b [1843–4]: Beck, 1992: ch. 8; see Authors, 2016b).

12 Consequently, while not endorsing his radical theorization of disruption in society driven by the ‘logic of networks’ (Castells, 2000) this paper follows Castells (1989: 3) in emphasizing that the study of the ‘historically articulated complex of transformations’ associated with the digital economy must be attuned to ‘capitalism, as a social system’ as well as the increasing focus on information and the development of information technology as a source of value (Castells, 1989).

13 This reconstruction of Beck’s risk society differs from Lash’s (2002) transformationalist account of the role of information in social life that augurs for the breakdown of the distinction between exchange value and use value.

14 That the contemporary articulation of the digital economy focuses on exchange value for private actors differs from the internet’s original development as primarily a state and military project (see Castells, 2000). Thanks to Dave Elder-Vass for emphasizing the importance of this point in light of the discussion.

15 This point does not deny that significant parts of the digital economy are not aimed at exchange value (see Elder-Vass, 2016), such as Wikipedia, but rather emphasizes how the dominant fundamental forces driving the current dynamics of innovation of the digital economy are primarily oriented towards the exchange value of these innovations.
For a discussion of the idea of the digital economy as an ecosystem, see Hassan (2008: 4).

The intention of this paper is to address the intersection of innovation, failures of democracy, and the emergence of social risk as manifested in the digital economy. For recent important discussions of media, social life, and democracy more generally, see (Crary, 2013; Stiegler, 2015; Wu, 2016).

For an excellent discussion of some of the features of this period, see Van Dijck (2007).

Wark (2004) also provides an interesting discussion of the potential implications for class and power relations of the shift to information as the primary form of private property.

Crary (2013: 68) argues that despite the emergence of capitalist time-regulated spaces at the turn of the 19th century, from the 1850s to the 1990s, these administered spaces of capitalist speed and productivity co-existed with layers of everyday life that were ‘unadministered’ and that were at least ‘partially detached from disciplinary imperatives’. For Crary (2013: 74–5) the rise of 24/7 capitalism associated with the current conjuncture of the digital economy is increasingly imposing a continuous interface that necessitates synchronization of time and patterns of life in a much more powerful manner than these earlier phases of industrialization. Yet, as the quest to commercialize sleep signifies, there are still zones of everyday life that provide further opportunities for corporate intrusion for the purposes of expanding profit (Crary, 2013).

As the CEO of Apple, Tim Cook, recently declared, the intention of the company is to have users of the newest iPhone ask ‘how did I live without this?’ (Cook in Gibbs, 2016a). The context of Cook’s quote for developing new needs in consumers was not in terms of augmenting Apple’s social contribution, but rather a means of the CEO fending off criticisms because Apple had experienced lower upgrading of devices than the previous record-setting year, which had caused declines in their share price (Gibbs, 2016a).
22 For a powerful discussion of the general acceleration of the rhythms of social life, see Rosa (2013).

23 For an excellent critique of these ideologies with respect to ‘social’ media, see Van Dijck and Nieborg (2009) and for finance, see Engelen et al. (2011: ch 1).

24 Giddens (1990), though not dealing with the political economy of knowledge in an adequate manner, importantly highlights how the need for the capitalist ‘expanded reproduction’ shapes contemporary risk.


26 See also Authors (2017).

27 Beck (1992) understood contemporary individualization as one in which ‘biographical solutions’ are employed to address ‘systemic contradictions’, rather than individualization as the nullification of social causation (Beck, 1992: 137). Furlong and Cartmel (2007 [1997]) have insightfully noted that the increasing perception of social causation as individualistic causation is a key ‘epistemological error’ of our age.

28 The attempt to update Beck’s work for contemporary problems has been attempted in Authors (2016a), though this statement is only a first step in addressing these problems.
References


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