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Communication, crisis and control: Economies, ecologies and technologies of digital times[1]

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SUMMARY

Up until recently media analysis has paid little attention to their material bases in assemblies of machines and infrastructures and global chains of labour. This is now changing. The multiplication of always/on, always/there, tablets and smart phones has coincided with accelerating climate change and greater awareness of the globalisation of economic activity. To properly understand how these processes are interrelated two essential conditions need to be met. Firstly, we need to locate 'new' media in historical perspective and examine the ways communication has been shaped by cumulative economic, ecological and political processes set in motion by the rise of modern capitalism. Secondly, we need to explore how these dynamics have been reproduced and intensified with the return of market fundamentalism from the mid-1970s onwards. Having sketched this context, the paper goes on to the detail how the leading digital companies have played a central role in the restoration of profitability and have exploited the increased degrees of corporate freedom introduced by global marketization to dominate their spheres of influence developing organisational forms and operational practices that are creating digital despotisms that are coming more and more to resemble medieval city states.

Keywords: digital media, market fundamentalism, media materialities, climate change, labour exploitation, intensified consumption

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Missing materialities

Most media research has focused on the institutional formations and symbolic fields that act as go-betweens, connecting us across distances of geography and history. This project has generated two very substantial bodies of theorising and research. Institutional analysis explores the operation of media as organised sites of meaning making embedded in, and interacting with wider economic and political complexes of power. It draws on insights and frameworks from political economy, sociology, anthropology, law, and political science to detail the changing structure of the communication industries and their shifting role in the organisation of production, promotion and consumption and the operations of states and governments. Cultural analysis unpicks the ways meaning is constructed in language, imagery, sound and ritual, variably combined in different expressive forms, and how these symbolic resources are drawn on as resources for everyday understanding, self-presentation, and social relations.

Both these domains of study remain absolutely foundational for a comprehensive analysis of contemporary communication but there is a third dimension of mediation that has received less sustained attention: the media's material base. Media are never only institutional and symbolic systems they are also arrays of machines supported by infrastructural networks. When domestic communications centred around a single television set situated in the main living room and a lone telephone connected to a land line, questions of the resources used in their manufacture, the energy they consumed in use, and the waste and pollution they contributed to when they were thrown away, were relatively easily consigned to the background of attention. For families on average income television sets were 'big ticket' purchases, intended to last for years, and only replaced when a major innovation, like the introduction of colour, arrived. In many European societies both energy supply and telephone services were public utilities with controlled prices. This relatively stable situation has been irreversibly upended by the intersection of two major disruptions; digitalisation and marketization.

We now live in a communications environment increasingly organised around smart phones and tablets, always on/always there devices, which we are urged to discard and upgrade on an almost annual basis. The data we generate through continuous use is increasingly stored in massive server farms making escalating demands on energy and water supplies that are concealed by marketing promoting the seemingly immaterial 'cloud'. The fact that the rapid expansion of digital media has coincided with an escalation of the climate crisis is not an accident. The two are inextricably bound together raising urgent questions about the relations between communication system and environmental integrity.

In order to properly understand these relations however we need to contextualise them. The rollout of digital technologies and the emergence of the internet as a mass utility has taken place within the same time fame as the return to market fundamentalist models of economic management with far reaching consequences for the ways they have been organised and deployed. In opposition to all forms of technological determinism needs to begin our analysis not from the introduction of machines and infrastructures and their capacities, but from the social interests that decide which ideas will be funded, which technological potentials will be actualised and which supressed, and who will own and direct them. This is not to say that organisation and use can always be pushed in only one direction. As Hans Enzensberger noted, technologies may be 'leaky' and support alternative visions of their social potential. The internet is a classic case in point. We can write its history as a narrative of continuous struggle between visions of a flat, horizontal, network of peer-to-peer exchange, collaboration, and participation, and the drive by the major communications companies and platforms to reorganise it as a vertical, top down, channel of distribution which appropriates user activity to target advertising appeals and products more effectively. This competition remains open but the advantage lies with capital.

In the notebooks Marx compiled in preparation for writing *Capital,* which we now know as the *Grundrisse,* he sees the organisation of communications playing a pivotal role in capital's incessant drive to expand markets and reduce the 'dead' time between products leaving the factory and being purchased by consumers.

"Capital by its nature drives beyond every spatial barrier. Thus the creation … of the means of communication and transport – the annihilation of space by time – becomes and extraordinary necessity for it." (Marx, 1973/1857–1858: 524)

Note that he separates transportation, which involves the physical carriage of objects and resources, from communication. He was writing against the background of both the rapid development of the telegraph system and the great boom in railway building. The telegraph was the first communication technology that did away with tangible forms of transmitting messages. There were no written letters, printed books, or bulky gifts and with the adoption of Samuel Morse's code of dots it became a digital system. This led commentators at the time to see it as a thoroughly immaterial system in which, to borrow one of Marx's most famous phrases, 'everything solid melts into air' or at least into electric pulses travelling along a wire. The fact that its operations depended on very material infrastructures and a specific organisation of labour, was conveniently pushed to the background of attention. There were the telegraph machines themselves and the networks of connecting wires and undersea cables, the telegraph operators who translated peoples' written notes into Morse's code at one end and decoded them at the other, and the runners who deliv-

ered the printed telegrams to their recipients. They depended in turn on the workers in the mines who extracted the raw materials required to build the system and the energy needed run it, the workers who assembled and maintained it, and those toiling in the salvage and scrap yards searching for reusable components after the machines had reached the end of their productive life and been discarded.

Communications may appear to be immaterial when it moves over wired connections or through the radio spectrum but it is always and everywhere dependent on a solid material base of resources and labour. Retrieving the landscapes and lives that make up this base, rescuing them from the invisibility that much media theory has relegated them to, is an essential first step to crafting a critical analysis of the contemporary relations between technologies, economies and ecologies. At the same time, we must reject the celebration of the newness of 'new media' in much writing on digital media with its underlying assumption that we have broken decisively with the past and are moving into an entirely different world. To understand our present situation we need to return to processes set in motion in the formative period of modern capitalism, and to the contradictions at their centre.

Lineages of the present

Critical theory explores the way present conditions are shaped by deep processes of transformation that unfold over long loops of time. But these processes may be thrown into sharp relief by events within a concentrated period. The year 1776 was one such moment.

Three events occurred in that year, unrelated at the time but subsequently binding together economies, technologies and ecologies in ways that we are still living with. In Scotland Adam Smith published *The Wealth of Nations*. In England James Watt delivered improved versions of his steam engine, incorporating a condensing mechanism that increased their efficiency, to the Bloomfield colliery and John Wilkinson's iron works, twin pillars of accelerating industrialisation. And in Philadelphia the thirteen American colonies issued the United States Declaration of Independence affirming their refusal of Great Britain's colonial rule.

Smith's mistake: The costs of self-interest

Smith was a complex and conflicted figure who believed that altruism and care for others were the highest human values, but the *Wealth of Nations* was informed by a hard-nosed recognition that the emerging economy of capitalism would be propelled primarily by the pursuit of personal gain. As he noted;

"It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own self-interest. We address ourselves not to their humanity but to their self-love." (Smith, 1986/1776: 119)

This entirely realistic assessment posed a problem. What was to stop businesses exploiting their workers and customers? Smith's answer, which he introduced in his earlier book, *The Theory of Moral Sentiments,* was to present markets as self-correcting, regulated by an invisible hand that ensured that labour was exchanged for a fair wage and commodities for a fair price, and income and wealth distributed justly and equitably. In a celebrated passage of wishful thinking he claimed that:

> *The rich … in spite of their natural selfishness and rapacity [and] though the sole end which they propose from the labours of all the thousands whom they employ, be the gratification of their own vain and insatiable desires … are led by an invisible hand [emphasis added] to make nearly the same distribution of the necessaries of life, which would have been made, had the earth been divided into equal portions among all its inhabitants. (Smith, 1969/1759: 264–265)*

Grounded in a thorough-going liberal philosophy of personal freedom Smith's priority was to maximise individual choices, of investment and consumption, and minimise state interference in the operation of markets. By characterising capitalism as a market economy and focussing on the moment of exchange he was able to ignore two central features of capitalism that contradict his idealised account.Firstly, competition inevitably gives way to concentration as companies with greater productive and financial resources buy up their rivals or force them out of business. Secondly, far from the gains of enterprise 'trickling down' the social scale, capitalists, if left unconstrained, will retain the largest possible share of profits for themselves. Rather than being governed by an invisible hand capitalism is ruled by an iron fist of unequal accumulation.

Contesting this winner-takes-all mentality has been central to social successive movements to install progressive taxation, develop welfare systems, limit corporate concentration of ownership, impose public interest regulations on corporate activity, and organise essential communicative resources as public utilities. These struggles produced these various forms of welfare capitalism that reached their fullest development in the years between 1945 and 1975. Across Western Europe the central communication systems of broadcasting and telecommunications were publically owned and operated and income and wealth gaps were closing. Then, in the mid-1970s advanced capitalism entered a period of crisis. Advocates of Smith's liberal economics, the so-called new or neo liberals, blamed excessive government regulation of corporate enterprise and the inefficiencies of public ownership and argued for a concerted program of deregulation and privatisation. In Margaret

Thatcher in Britain and Ronald Reagan in the US they found enthusiastic political champions willing and able to translate theory into practice. Versions of their neoliberal policy template gained ground within Europe and within emerging economies.

It was precisely at this moment, when neo-liberalism was becoming established as the new economic orthodoxy, supported in general terms by social democratic as well as conservative administrations, typified by Bill Clinton's Democratic Presidencies in the United States and Tony Blair's New Labour Governments in Britain, that popular engagement with the internet begins to accelerate and the companies that now organise and direct that engagement enter the contest for users' on-line time and attention. The two major forces in personal computing Microsoft and Apple launched in 1975 and 1976, followed after the World Wide Web became publically accessible by the key sites organising home shopping, internet search and social connection: Amazon in 1994, Google in 1998, and Facebook in 2004. These five companies now dominate everyday internet use and have played a key role in the reconstruction of capitalism.

Watt's machines: Carbon and climate change

The moment of capitalist crisis in the mid-1970s and its aftermath was also the moment when global warming, which had been steadily rising since the beginning of industrialisation, took a sharp upward turn.

One widely used index of climate change that allows for reliable comparisons over time is the volume of carbon dioxide, the major 'greenhouse gas', in the atmosphere. Calculations by the Nobel Prize winning atmospheric chemist, Paul Crutzen and his colleagues have shown that in 1750 the atmospheric concentration of CO2 stood at 277 ppm (by volume). By 1850 it had climbed 285 ppm and by 1945 it was 25 ppm above the pre-industrial level, taking it well outside the range of natural variability (Steffen, Crutzen and McNeil, 2007: 616). In later papers Crutzen and his colleagues identify the years between 1950 and 1973 as a distinctive period of accelerating climate change (Steffen, Grinevald, Crutzen and McNeil, 2011: 850), and go on to argue that human influence on the climate has been most evident in the years since 1970 (Gaffney and Steffen, 2017: 4)

Many commentators now date the onset of this 'great acceleration' in human impacts on the climate to the central role that steam power played in driving industrialisation. Watt's engines, and their successors, were meta-technologies with multiple applications, from domestic heating, to factory machinery and railway and steamship transportation. But because their operation required large volumes of coal they shifted energy supply decisively away from the renewable sources pro-

vided by wind, wood and water and animal and human muscle towards an increasingly reliance on finite supplies of fossil fuels, ancient buried forms of carbon that had to be brought to the surface. Concentrated sites of extraction, initially coal mines and open cast pits and later oil wells to fuel the internal combustion engine, the successor to the steam engine, radically altered landscapes and made their own substantial contributions to pollution and warming.

This did not go unnoticed at the time. Observing the wholesale clearances of forests to make way for the expanding industrial cities and the dense columns of black smoke rising from the funnels on the new steam driven railways trains and the chimneys of the new factories, Eugene Huzar, a provincial French lawyer, writing in 1855, foresaw an environmental catastrophe.

> *"In a hundred or two hundred years the world, crisscrossed by railways and steamboats, covered with factories and mills, will emit trillions of cubic meters of carbonic acid and carbon monoxide. And since the forests will have been destroyed, all this carbonic acid and carbon monoxide could well somewhat perturb the harmony of the world" (quoted in Bonneuil and Fressoz, 2016: xii)*

It was not until the closing years of the century that scientific inquiries were able to establish an empirical link between fossil fuels and global warming, but Huzar's argument was more general. He was pointing to the contradiction at the heart of modern conceptions of 'progress' which measured it in terms of increasing productivity and technological innovation with little or no regard for the impact on environmental integrity. The more successful capitalism was as a system of profit generation the more it depleted and degraded finite natural resources and contaminated the environment. This brute fact was consistently denied by those with a material interest in maintaining a system that underpinned their wealth and privilege. Their argument appeared plausible because much of the dirty work of primary resource extraction, with its environmental and social costs, was located in areas some way removed from the centres of comfortable living. You cannot see the Keystone pipeline that runs through the ancestral lands of the Sioux peoples in South Dakota, and which has just spilled 210,000 gallons of oil, from the corporate skyscrapers of Wall Street. This relegation of attention is rooted in a fundamental contradiction in the constitution of modern democracies.

Dependent democracy: Republic versus Empire

It is one of the great ironies of modern history that the United States, the first revolutionary republic, should from the outset continue to be caught up in the asymmetric power relations of empire. In 1804, Thomas Jefferson, the principal author of the

Declaration of Independence, and by then President, moved to support the French empire's attempts to suppress the successful slave rebellion in Haiti that after more than a decade of struggle had established an independent emancipated state on the island under the uprising's leader, Toussaint Louverture. Jefferson feared that it would inspire uprisings among the slaves working on American plantations and it was not until 1862, following the defeat of the confederate slave states in the Civil War that the United States formally recognised Haiti. By then, the relentless push westwards had already annexed the prime land and resources of the continent's native peoples.

The pursuit of industrialisation also required an aggressive policy of "economic imperialism" overseas, backed where necessary by military force, to ensure ready supplies of cheap raw materials and labour and compliant new markets. With the collapse of the European empires after World War II, this reliance on economic pressure and strategic intervention replaced the colonial occupation as the dominant strategy for maintaining asymmetric global power relations within a competitive arena reconstructed around the financial and trade institutions devised by the Allied Powers at the Bretton Woods conference in New Hampshire in 1944. They included the International Monetary Fund (IMF) and the General Agreement on Tariffs and Trade (GATT), the forerunner of the World Trade Organisation. The aim was to ensure that the newly independent post-colonial states rejected the communist alternatives represented by the Soviet Union and China, and operated within a global 'free market' organised to preserve the historic competitive advantages enjoyed by the leading capitalist economies. The result was to perpetuate the asymmetric relations of empire and ensure that supplies of many of the consumer goods that were now within the reach of average wage earners in the West continued to rely on raw materials and exploited labour in countries where the organisation of extraction and production remained largely out of sight and out of mind.

As we noted earlier however, within the leading 'free market' nations the early free-for-all variant of corporate capitalism had been tempered by varying combinations of progressive taxation, public interest regulation and public ownership, and strong trade union movements. It was this version of 'welfare capitalism' that was challenged and then dismantled in the wake of the structural crisis of capitalism of the mid-1970s.

Capitalising on crisis: Market fundamentalism

Neoliberal responses to crisis have been characterised by five fundamental interventions in the organisation of capitalism: the redirection of economic activity from the public to the corporate sector, the relaxation of regulations governing corporate behaviour, the reordering of production and labour, the redistribution of income and

wealth to the top of the income and wealth scales, and the acceleration and intensification of domestic consumption.

Firstly, corporations have been allowed to enter areas of activity they were previously excluded from, substantially increasing their range and extent. Successive privatisations have dismantled the public utilities that previously operated key infrastructural resources. Telecommunication system have been sold off the private investors across the European Union and in Britain, which pioneered this shift, they have been joined by the energy and railway systems. Elsewhere, as in France, public broadcasting organisations have been sold.

Secondly, the responsibility for disciplining corporations has prioritised self-regulation by the industries rather than independent oversight, and in areas where statutory agencies continues to operate its rationale has shifted from defending the public interest to overseeing market operations and addressing market failures.

Thirdly, there have been concerted and consistent corporate efforts to reduce labour costs. Trade union rights have been eroded and weakened. Permanent employment contracts carrying company responsibilities for holiday pay, sick leave, and pensions, have been increasingly displaced by short-term contracts and 'outsourcing' to independent contractors and freelance workers who are responsible for securing their own cover for illness and their own pensions. The resulting dispersal of the workforce has made trade union organisation more difficult tilting the balance of power in favour of employers, an advantage reinforced by the weakening of legislation guaranteeing workers' rights, including the right to strike.

Fourthly, taxation systems have been readjusted to allow companies and high net wealth individuals to retain a significantly increased share of profits and income from accumulated assets. The rates levied on corporations, high earners, and on transfers of wealth, have been progressively reduced while legal loopholes allowing the rich to avoid paying tax or paying only the absolute minimum, have proliferated.

As Thomas Picketty's (2014) pioneering research has shown, the combination of the squeeze on real wages and the redirection of gains to the top, has seen the trend for income and wealth gaps to narrow over the period between 1945 and 1975 reversed with sharply rising inequalities.

This trend posed problems for the need to boost domestic consumption. In part at least, the crisis of the mid 1970s was a crisis of overproduction and under consumption. Over the course of the long post war economic boom, more and more families on average incomes had been able to acquire a range of the 'big ticket' items; refrigerators, television sets, cars, vacuum cleaners and other household appliances. These goods were expected to last and were not being replaced. If they broke down there were repair shops that would extend their useful life. Deconstructing this system of stable domestic consumption was essential to rebooting capitalism.

This was achieved by a combination of strategies. Firstly, consumption was expanded by accelerating the rate at which items became obsolescent and when they broke down it became increasingly difficult to find spare parts to repair them since in the interim new models had been introduced using new, modified, components. Consumers were exhorted to acquire the habit of discarding old models and investing in the most up-to-date technologies. This new regime of disposability was reinforced by a shift in the organisation of product promotion. The basis shifted from appeals to utility and value for money to celebrating commodities as extensions of the self and necessary props in the theatre of personal presentation. The result was a generalised fashion system in which style and appearance became the essential currency of social relations and social competition.

Promoting this new consumer system required new forms of publicity and marketing that could cement more intimate relations between commodities and consumers. One strategy was to intensify branding and the narcissisms of small differences. A second was to develop forms of advertising that displayed products as integral to desired life styles. New forms of 'native' and embedded appeal, led by product placement, proliferated.

But there was still the problem of supporting this intensification of consumption when real wages were falling and household incomes were being squeezed. The solution was to massively expand the volume of consumer credit by issuing a proliferating range of cards that allowed for borrowing against future income to fund immediate purchases.

As a result of these interventions neo liberalism set in motion a fundamental shift in imagination and values alongside the reconstruction of structural arrangements. Drawing on the Google Book Ngram Viewer data base of digitalised books published in English in the US and Great Britain from 1800 onwards, Patricia Greenfield (2013) has tracked the changing frequency with which key words indicating underlying cultural dispositions appear in print. Up until the mid-1960s 'give', with its connotations of personal generosity and communality, occurred much more frequently than 'get'. From the mid-1970s onwards however, uses of 'get' showed a steep rise while mentions of 'give' fell, suggesting a shift towards a more acquisitive, personalised culture (ibid.).

Digital media then, emerged onto an economic and imaginative playing field already substantially reconstructed, both structurally and culturally, by the return of market fundamentalism. The leading digital companies have taken full advantage of the new operational freedoms granted to corporations to increasingly dominate popular communications activity and build concerns that operate on increasingly despotic lines.

Digital despotisms

As numerous commentators have shown, the relaxation of the rules governing mergers and acquisitions has led ownership of key production and distribution facilities in the established print and audio-visual sectors becoming concentrated in the hands of a small number of multi-media conglomerates (Birkinbne, Gomez and Wasko, 2017). Digital media have benefitted from the additional advantage that governments have seen their rapid expansion as an essential foundation for a post-industrial economy organised around the production and deployment of information and cultural goods and services. This hands-off stance has allowed the companies that now dominate popular internet use, Amazon (launched 1994), Google (launched 1998) and Facebook (launched 2004), to build virtual monopolies in their core areas of activity. Their domination has been reinforced by the network effects that encourage new users to gravitate to sites that already have the most users. Amazon now accounts for half of all on-line payments in the US. Ninety percent of all internet searches in Europe and eight eighty eight percent in the US use Google. Three quarters of mobile social media interactions in Western countries are now made on Facebook which claims to have two billion members world-wide. The income these activities generate has propelled these Internet majors to the front rank of the world's largest companies measured by market value. They are joined by Apple and Microsoft, the early entrants and still dominant forces in personal computing. The latest figures rank Apple, Alphabet (Google's holding company) and Microsoft first, second and third, with Amazon in sixth place and Facebook in seventh (Statista, 2017). Despite raising additional funds from public stock issues shares carrying votes for membership in boards of directors remain securely concentrated in the hands of company founders, giving them total control over decision making and strategy.

The digital majors have made concerted efforts to cut production costs by moving work overseas taking advantage of the substantially lower wage rates in the emerging economies of the global South and East opened up by neo liberal globalisation. The cost advantages of 'offshoring' have been most evident in the organisation of routine assembly work. Apple and the other major western companies involved in manufacturing smart phones and tablets have all relied heavily on labour employed by subcontractors located in Asia. The workers are disproportionately female, often recent rural migrants, working long hours with little opportunity for breaks, and subject to intense surveillance to ensure that they meet production quotas. This structure of exploitation is concealed from the end users of smart phones by the elegant styling and the barrage of advertising promising enhanced features and focussing consumers' attention on the value of the object to them in their everyday lives (Qiu, 2016).

The assembly factories however are only one moment in a production chain that stretches backwards to the sites where the minerals needed for essential components are mined and forwards to the container ships transporting the completed commodities to their retail destinations. Every link in this chain imposes substantial environmental as well as social costs leaving a trail of ravaged landscapes, energy depletion, and air and sea pollution, in its wake.

These social and environmental impacts point up the continuing structural contradiction between republic and empire. Once again the material and cultural privileges enjoyed by affluent consumers in the North are obtained at the cost of the continuing exploitation of workers and environmental degradation in the South.

In another major cost cutting move, digital work that has remained based in the central economies of the North has been increasingly contracted out to small suppliers or freelance workers. Corporations gain two substantial benefits from this transfer. Firstly, they avoid paying for the entitlements to paid holidays, sick pay, maternity leave, and pensions that permanent company employees have secured through collective bargaining.Secondly, the direct costs of production fall on the shoulders of the contractor hired for a specific task or project. They pay for the equipment they use, for the purchase or rental of workspace, for the heat, light and energy they consume while working, and for any additional training they may need to upgrade their skills. In addition, the conditions of employment are arranged to maximise returns to the corporations.

Freelance workers developing applications, ‘apps’, for the mobile phones sold by Apple and Google for example, face a number of hurdles in securing a return on their labour. Apple insists on approving all apps loaded onto one of their devices. One accepted, the developer has to undertake additional work to ensure that their app features in the Top 100 lists, using social networks intensively to promote themselves and ensure that they are noticed. Developers set the price for the applications they produce but Apple takes thirty per cent of the sale revenues as payment for access to their platform.

There is old saying that has always applied to unequal access to job opportunities, that it is ‘not what you know, but who you know’. Because it organises labour on a project by project basis outsourcing has significantly increased the importance of integration into the key social networks that determine professional reputation and allocate job opportunities. Possession of social capital is now essential. This works to the advantage of workers who already have established ties through family, shared education, or work on past projects, and can devote significant time and energy to cultivating and maintaining new connections. It works to the disadvantage of workers from poor or ethnic minority families whose social background has excluded them from circles of influence.

Labour that continues to be based within plants operated by the major digital companies has been increasingly divided into a restricted strata of workers on permanent contracts and an expanding group operating on temporary or fixed term arrangements, erecting resilient divisions between different levels of job security, pay and conditions. In 2000, 11% of the workforce at Microsoft's operating branch near Seattle were hired from outside agencies and were on temporary contracts. Some were earning less than the recognised living wage and, in a very visible signal of their separate status, were required to wear orange identity badges, in contrast the blue badges carried by permanent staff.

The digital majors have also been in the forefront of the drive to restore general levels of corporate profitability by intensifying and accelerating consumption. Their ability to assemble text, image, voice and sound in entirely new ways to employ interactivity to develop engaging and immersive user experiences, and to construct detailed user profiles, has had three major impacts.

Firstly, it has erased the traditional lines separating editorial and creative content from promotional materials and generated multiple strategies designed to integrate product appeals into cultural forms. Advergames, sponsored video, product placements and other form of 'native' advertising naturalise promotion. It no longer appears a readily identifiable invitation to consume displayed on billboards and magazine pages that can be passed over or in television ads that can be skipped. It is always now present on screen, an integral element in engaging narratives and games, continually cementing associations between brands, lifestyles and self-conceptions.

Secondly, interactivity has allowed companies to capitalise on the energy, enthusiasm and expertise of users to co-op them as unpaid labourers, contributing ideas for product developments or modifications and acting as 'brand ambassadors' promoting products to friends on line through recommendations and 'likes'.

Thirdly, the business model of Google and Facebook depends on collecting all the data generated by users' activities and analysing it to develop personalised profiles that can then be used to micro manage promotional appeals tailored to tap into known preferences and interests. The promised efficiency of this fine targeting has persuaded many advertisers to redirect their spending on-line precipitating a crisis in the newspaper industry with local titles closing on a daily basis and nationals cutting back on staff.

These strategies have made a major contribution to increasing general levels of consumption, an outcome reinforced by the recent arrival of 'frictionless' payments using smart phones, the latest stage in the transition from coins and banknotes, through credit cards, to screen based recognition designed to reduce to a minimum the time allocated to reconsideration and second thoughts. As an old slogan for an early electronic payment system on US cable television promised: 'You see it, you want, you click, you have it.'

In addition to playing a central role in accelerating general consumption however digital media have made a substantial contribution in their own right. The ubiquity of always/on always /there tablets and smart phones has multiplied the number of appliances in circulation and use adding significantly to demands on scarce resources and energy supplies. The increasing rapidity with which these machines are upgraded and new models introduced has also significantly accelerated disposal rates compounding problems of waste. The latest Apple iPhone is the ninth to be released. Compact discs and DVDs, which replaced cassette and video tapes, are now themselves being displaced by streaming as the preferred mode of access to recorded music, film and television.

Google and Facebook's ability to fine tune the cultural materials that users see on screen goes beyond advertising to cover news and comment. By insisting that they are platforms not publishers they have so far resisted pressure to abide by the editorial protocols and values that govern print and broadcast journalism using their economic leverage to lobby aggressively to head off any legislative initiatives that might cut across their operations. In the US the Big Five digital concerns currently outspend both the leading five banks and the leading five oil companies on lobbying elected representatives and government agencies. They support their claims to exemption by emphasising that their gatekeeping relies on supposedly 'objective' computer algorithms rather than fallible human decisions. There are several obvious problems with this argument. Firstly, computer programs are social constructs and are likely to reproduce the blind spots of their creators. Secondly, unlike conventional editorial decision these biases remain invisible and unavailable to argument and challenge. This removal from open scrutiny is reinforced by the fact that the composition of these algorithms is commercially privileged and protected by intellectual property law.

As recent incidents have demonstrated, the failure of algorithmic sorting to take any account of context or intention can produce perverse results. Facebook's standing prohibition on depictions of nudity led to the deletion of one of the most famous news photographs from the war in Vietnam showing a small girl running naked towards the camera during a napalm attack on her village. The photo had been posted by a Norwegian journalist as part of a serious discussion of the role of photography in conflict zones. Evidence to a recent US Congressional select committee revealed that in 2016, between September 1 and November 15, 37,000 automatic 'bot' accounts based in Russia released 1.4 million fabricated 'tweets' impersonating news organisations and political parties and groups (Booth et al., 2017). These distortions, coupled with the direction of material to users on the basis of their expressed preferences locking them into echo chambers that endlessly reproduce already endorsed opinions, destroys the possibility of open deliberation on contentious issues essential to a fully functioning democracy. In its place the digital majors are creating

a new despotism in which their business models decide what users of the now central media of communication will encounter, see and read.

This erosion of the ideal of citizenship as a social contract that balances guarantees of individual right against the responsibility to contribute to the quality of collective life, is compounded by the digital major's exclusive claim to the personal data generated on line. Every click on the keyboard or swipe across the screen adds to the store of information about us that these corporations hold reinforcing a markedly asymmetric relation of power. While they know more and more, their operations remain opaque and invisible, securely sealed by commercial privilege. We all now have two identities, our physical selves and our digital doubles. Increasingly they are pitched against each other. As a recent study of Facebook concluded, "the predictability of individual attributes from digital records of behaviour may have considerable negative implications … One can imagine situations in which such predictions, even if incorrect, could pose a threat to an individual's well-being, freedom or even life" (Kosinski, Stillwell and Thore, 2013: 5805). These 'threats' may include denial of insurance, inability to secure a loan, refusal of employment, or classification as a suspected danger to public order.

This structure of radical information inequalities is currently being reinforced by the rapid growth of intelligent machines and the internet of things. The proliferation of drones, smart appliances, and self-driving vehicles will massively increase the volume of personal information available for commercial analysis and use. It will also add significantly to the environmental pressures on scare resources and energy supplies and to problems of disposability and waste.

Those now in charge of the leading digital companies are coming more and more to resemble feudal despots. Like the kings and princes of old they are separated from the lives of ordinary people by immense wealth. Bill Gates of Microsoft and Jeff Bezos of Amazon, together with the fund manager Warren Buffet, an early investor in digital enterprises, are currently the three richest men in the United States with a combined wealth equal to that held by the 160 million people relegated to the bottom half of the society (Collin and Hoxie, 2017). While they can no longer lay claim to divine right the leading digital entrepreneurs insist on the supreme agency of technology. Peter Thiel, a prominent figure in the Silicon Valley community has proclaimed with his customary bluntness that "Humans are distinguished from other species by our ability to work miracles. We call those miracles technology" (quoted in Earle 2017: 3). But as he has been quick to add that realising these miracles' full potential and making sure they are employed productively requires minimum interference from government. As he argued in a 2009 essay, "The fate of our world may depend on the effort [to] build or propagate the machinery of freedom that makes the world safe for capitalism." (Thiel, 2009) In pursuit of this goal he has advocated relocating digital enterprise to

artificial ocean islands beyond the jurisdiction of any national government. He has been joined in his desire to emancipate himself from democratic accountability by Larry Page of Google who has called for territory to be set aside for testing new ideas unhindered by political oversight and by the venture capitalist Tim Draper who has argued for Silicon Valley constituting itself as an independent state.

These ideas point to digital majors' increasing sense of themselves as institutions apart, detached from responsibility to contribute to common resources in the countries where they operate, a stance confirmed by their taxation strategies. They have consistently minimised the tax they pay by taking full advantage of the legal avoidance systems that have been integral to the redistribution of income and wealth upwards under neo liberalism. In 2014 Facebook's operations in the UK paid only £4,327 in corporation tax, less than the average British worker. In contrast, that same year the company's UK employees received a total of £35million in bonuses.

The comparison with the city states of medieval Italy is entirely apposite. Like Medici of Florence the digital majors see themselves as pioneers of new knowledge and invention exercising absolute power over their domains safely enclosed behind protective walls. Dismantling those walls and redeploying digital technologies in the service of social and economic justice and shared responsibility for the integrity of the natural environment is one of the central struggles of our time.

NOTES

[1] This paper was originally delivered as a lecture at the Faculty of Social Sciences (University of Ljubljana, November 22, 2016) and I would like to thank the organisers for giving me the opportunity to think through ideas I had been working on for some time. I am also grateful to the audience for searching questions and discussion that promoted me to revisit some of my assumptions. I have taken the opportunity of preparing the speech for publication to develop and clarify the core arguments and add new material and examples.

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Komuniciranje, kriza i kontrola: Ekonomije, ekologije i tehnologije u digitalnom vremenu

Graham Murdock

SAŽETAK

Dosad su medijske analize posvećivale malo pažnje materijalnim bazama u sklapanju strojeva, infrastrukturi i svjetskim lancima proizvodnje. To se sada mijenja. Porast vječno uključenih, vječno dostupnih tableta i pametnih telefona podudara se s ubrzanim klimatskim promjenama i većom svijesti o globalizaciji ekonomskih aktivnosti. Kako bismo mogli razumjeti kako su ti procesi međusobno povezani moraju biti zadovoljena dva osnova uvjeta. Prvo, moramo smjestiti "nove" medije u povijesni okvir i proučiti kako su komuniciranje oblikovali promjenjivi ekonomski, ekološki i politički procesi koje je pokrenuo uzlet modernog kapitalizma. Drugo, moramo istražiti kako su se taj razvoj umnožavao i osnaživao s povratkom tržišnog fundamentalizma od sredine 1970-ih do danas. Nakon skiciranja konteksta, ovaj rad se detaljno bavi time kako su vodeće digitalne kompanije odigrale ključnu ulogu u obnovi profitabilnosti i kako su iskoristile veći razmjer korporacijskih sloboda, koje je donijela globalna marketizacija, kako bi zavladali svojim sferama utjecaja osnivajući organizacijske oblike i operacionalne prakse, koje stvaraju digitalni despotizam koji sve više i više sliči srednjovjekovnim gradovima-državama.

Ključne riječi: digitalni mediji, tržišni fundamentalizam, medijska materijalnost, klimatske promjene, iskorištavanje radne snage, pojačana potrošnja