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The Hands and Brains of Digital Culture. Arguments for an Inclusive Approach to Cultural Labour.

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1. Introduction

Since the early 1970s theories of the “information revolution” (Dyer-Witheford 1999) have celebrated techno-scientific development as essential driving force of fundamental socio-economic transformations, allegedly leading to a new society that overcomes the negative features of industrial capitalism. Peter Drucker’s “age of discontinuity” (1969), Zbigniew Brzezinski’s “technetronic era” (1970), Daniel Bell’s “post-industrial society” (1974), Marc Porat’s “information economy” (1977) or Alvin Toffler’s “third wave” (1980) put forward a vision of a society organized around knowledge and information in which creativity, equality and the prevalence of high skilled knowledge work would replace alienated and exploited labour (Dyer-Witheford, 1999, 25). More recently Richard Florida has continued these debates, arguing that based on technology, talent and tolerance the “creative class” would be “the mobilising force today – the leading force at the beachhead of social, cultural, and economic change” (Florida 2012, xv) bringing in its wake a clean and green, sustainable, open and tolerant “creative economy” (Florida 2012, x).

These theories have in common that they not only attest a shift from manual to mental activities as dominant forms of wealth creation, but also stress the transformatory power of knowledge, information or creative work, making social struggles obsolete. They create the impression that we live in an information society in which the majority of labour and goods have become immaterial.

A focus on mental as opposed to manual labour also characterizes much of the debate on cultural work, which tends to be understood as the creative work of “symbol creators” (Hesmondhalgh 2013, 20). Hesmondhalgh and Baker (2011, 382) for example define cultural work as “those forms of labour with an especially strong element of aesthetic, expressive and symbolic making”. They oppose a broad definition of cultural work because it “risks eliminating the specific importance of culture, of mediated communication, and of the content of communication products” (Hesmondhalgh and Baker 2011, 60). According to Hesmondhalgh cultural labour deals “primarily with the industrial production and circulation of texts” (Hesmondhalgh 2013, 17). Just like in information society theory, concepts of cultural work and the cultural industries that foreground content production tend to approach culture as something immaterial.

In this paper I problematise the tendency to regard cultural work as exclusively immaterial, mental or symbolic work. I first argue that we should consider both the hands and brains of cultural production in order to avoid mystifying the materiality of digital culture. Using Raymond Williams’ cultural materialism as analytical framework I then discuss specific examples that illustrate the social and environmental impacts of contemporary culture. I highlight that in political

terms an inclusive approach to cultural labour is important as it can confront individualisation and inform solidarity across national and occupational boundaries. Finally, I conclude with some remarks on the meaning of work and the division of labour and suggest starting points for rethinking it.

2. The hands and brains of cultural production

The theories of the information revolution, which started to shift attention from manual to mental production, were developed during times of capitalist crisis and social transformation. One political-economic response to the crisis of Fordist capitalism in the 1970s was the gradual relocation of large parts of production activities from the industrialized core of the world economy to the former periphery, supported by neoliberal deregulations and trade liberalisations (Fröbel, Heinrichs and Kreye 1981; Smith 2012, 40; Harvey 2005, Munck 2002, 45).

Fröbel, Heinrichs and Kreye have described this development as “new international division of labour” (NIDL). To satisfy the corporate desire for cheap labour, commodity production became “increasingly subdivided into fragments which can be assigned to whichever part of the world can provide the most profitable combination of capital and labour” (Fröbel, Heinrichs and Kreye 1981, 15). The result was the emergence of global value chains and production networks in various industries. Among them also the electronics sector, an industry that is essential for the production of cultural technologies such as computers, video, film and music equipment, printers, photo cameras, media players etc.

Most everyday uses of culture today – from online newspapers to music streaming, digital film and music production, content editing, multimedia art, social media culture, digital photography – would be unthinkable without computer technologies and consumer electronics. While the industrial manufacturing of technological hardware remained crucial for cultural production and consumption, it also was outsourced to low-wage countries in Asia, Eastern Europe and South America and thus became increasingly invisible in the West.

Thus, while theorists of the information revolution were right to highlight the huge impacts of technological development on the organization of social life, this development did not mean the dissolution of physical, industrial production. Quite on the contrary, increased importance of computer technologies in the field of culture, eventually giving rise to digital culture, meant that its production and consumption became increasingly based on high-tech equipment. As Eric Howbsbawm highlights, cultural history has always also been a history of technological development: “What characterizes the arts in our century is their dependence on, and their transformation by, the historically unique technological revolution, particularly the technologies of communication and reproduction. For the second force that has revolutionised culture, that of the mass consumer society, is unthinkable without the technological revolution, for

example without film, without radio, without television, without portable sound in your shirt pocket” (Hobsbawm 2013, 9f).

The political-economic context of outsourced industrial production mixed with ideological hopes about a frictionless information society contributed to a myth of digital culture as weightless, immaterial and sustainable. Concepts such as “digital sublime” (Mosco 2004) or “technological sublime” (Maxwell and Miller 2012, 7) suggest that certain utopian ideals are attached to media and communication technologies. Maxwell and Miller argue that as a consequence the “way technology is experienced in daily life is far removed from the physical work and material resources that go into it” (Maxwell and Miller 2012, 7). The clean, immaculate and advanced surface of modern computer products hides the dirty reality of their production process.

Nick Dyer-Witheford therefore describes the value chain as “the dirty secret of the digital revolution” (Dyer-Witheford 2014, 169). Part of this “dirty secret” is that “the global information economy is built in part on the backs of tens of millions Chinese industrial workers” (Zhao and Duffy 2008, 229). Conceptualizing cultural labour only as mental and immaterial labour neglects the fact that it is underpinned by the availability of digital technologies whose production requires physical and manual labour.

A more inclusive approach to cultural labour can capture both the mental and manual labour that help to produce digital culture today. Vincent Mosco and Catherine McKercher suggested a broad definition of knowledge work that includes “anyone in the chain of producing and distributing knowledge products. In this view, the low-wage women workers in Silicon Valley and abroad who manufacture and assemble cables and electronic components are knowledge workers because they are an integral part of the value chain that results in the manufacturing of the central engine of knowledge production: the computer” (Mosco and McKercher 2009, 25). Similarly Hong (2011, 11) argues that “in the context of information and communications, we actually need to extend the concept of the ‘knowledge worker’ to include manual and industrial workers who are also essential to this industry”.

Considering both the hands and the brains of cultural production can avoid a cultural idealism that regards culture as merely immaterial and symbolic as well as a western centric-perspective that hides the various forms of labour involved in the global production of digital culture. Such an alternative perspective can be based on Raymond Williams’ cultural materialism.

3. Cultural materialism

Raymond Williams developed a materialist critique of the tendency to see culture as “dependent, secondary, ‘superstructural’: a realm of ‘mere’ ideas, beliefs, arts, customs, determined by the basic material history” (Williams 1977, 19). He argued that many discussions of the relationship between culture and economy, evolving around concepts such as reflection, reproduction, mediation,

homolog, often are problematic not because they are too economic and materialist but quite on the contrary, because they are not “materialist enough” (Williams 1977, 92). Instead of the idealist “separation of ‘culture’ from material social life” (Williams 1977, 19) Williams suggested a cultural materialism that emphasises “cultural practices as from the beginning social and material” (Williams 1990, 206).

Williams’s approach builds on the materialist insight that ideas are always part of material life processes. Marx and Engels for example highlighted that the “production of ideas, of conceptions, of consciousness, is at first directly interwoven with the material activity and the material intercourse of men” (Marx and Engels 1845/46, 42). Similarly Gramsci’s work is based on the insight that “ideas are themselves material forces” (Gramsci 1988, 215).

Beyond acknowledging the materiality of ideas, Williams’ approach also highlights the importance of considering the materiality of technologies that enable cultural production at a given historical stage. He criticises the “rhetorical isolation of ‘mass communications’ from the complex historical development of the means of communication as intrinsic, related and determined parts of the whole historical social and material process” (Williams 1980/2005 52). Williams therefore foregrounds the need to recognise that “the productive forces of ‘mental labour’ have, in themselves, an inescapable material and thus social history” (Williams 1990, 211).

A cultural materialist perspective thus means to consider the social and material history of the means of cultural production. Applying this perspective to the study of cultural labour pays attention to the work of mineral miners, workers in technology manufacturing and waste workers in electronics dumping grounds. As Williams highlights, cultural production “was, and is, co-operative material production involving many processes of a material and physical kind” (Williams 1977, 163).

Williams’ argument thus suggests appreciating culture as a totality that connects physical and ideational production processes. A broad perspective on cultural labour can help focussing attention also on the dark side of digital culture and acknowledge its widespread social and environmental implications.

4. De-mystifying digital culture: the dark side of consumer electronics

In 2010 the tragic suicides of 17 young workers at Apple’s supplier factory Foxconn¹ (FinnWatch, SACOM and SOMO 2011, 8; Wired Magazine 2011²) for a

¹ Foxconn is the trading name of the Taiwanese electronics manufacturing company Hon Hai Precision Industry Co. Ltd

² Wired Magazine. 2011. 1 Million Workers. 90 Million iPhones. 17 Suicides. Who’s to blame? By Joel Johnson on February 28, 2011. Retrieved from http://www.wired.com/magazine/2011/02/ff_joelinchina/all/1 on October 23, 2011.

moment lifted the veil of ignorance and revealed the harsh labour reality in electronics manufacturing. In May and June 2010 many major Western media were looking behind the surface of bright and shiny computer products. They reported about bad working conditions and desperate workers at factories, which are supplying Western brands with tablets, computers, mobile phones or cameras that are sold to millions of customers. The New York Times for example published an article titled *String of Suicides Continues at Electronics Supplier in China*³; the BBC reported on *Foxconn Suicides: 'Workers Feel Quite Lonely'*⁴, Time Magazine published a piece headed *Chinese Factory Under Scrutiny As Suicides Mount*⁵; The Guardian headlined *Latest Foxconn Suicide Raises Concern Over Factory Life in China*⁶, and CNN reported *Inside China Factory Hit By Suicides*⁷.

However, it did not take long until public attention paid to Apple's dirty secret started to dissipate and the company's reputation continued to flourish. In 2014 Fortune Magazine ranked Apple as the most admired company in the world – for the seventh year in a row⁸. The consultancy firm Reputation Institute based on the perception 55,000 people in 15 countries ranked Apple as the 5th most socially responsible company worldwide in 2014 (Reputation Institute 2014, 7). In earlier years Apple had been placed on rank 12 in 2013, rank 5 in 2012 and rank 2 in 2011 (Reputation Institute 2012, 19; 2013, 17).

Apple's image continues to be in stark contrast to evidence produced by corporate watch organisations during the past decade. Investigative research conducted by organisations such as Students and Scholars Against Corporate Misbehaviour (SACOM), China Labour Watch (CLW), Swedwatch or the Centre for Research on Multinational Corporations (SOMO) for many years has documented unacceptable working conditions at Foxconn as well as various

³ The New York Times. 2010. String of Suicides Continues at Electronics Supplier in China. By David Barboza on May 25, 2010. Retrieved from <http://www.nytimes.com/2010/05/26/technology/26suicide.html> on October 24, 2011.

⁴ BBC. 2010. Foxconn Suicides: 'Workers Feel Quite Lonely. On May 28, 2010. Retrieved from <http://www.bbc.co.uk/news/10182824> on October 24, 2011.

⁵ Time Magazine. 2010. Chinese Factory Under Scrutiny As Suicides Mount. On May 26, 2010. Retrieved from <http://www.time.com/time/world/article/0,8599,1991620,00.html> on October 24, 2011.

⁶ The Guardian. 2010. Latest Foxconn Suicide Raises Concern Over Factory Life in China. By Tania Branigan on May 17, 2010. Retrieved from <http://www.guardian.co.uk/world/2010/may/17/foxconn-suicide-china-factory-life> on October 24, 2011.

⁷ CNN. 2010. Inside China Factory Hit By Suicides. By John Vause on June 1, 2010. Retrieved from http://articles.cnn.com/2010-06-01/world/china.foxconn.inside.factory_1_foxconn-suicides-china-labor-bulletin?_s=PM:WORLD on October 24, 2011.

⁸ Fortune Magazine. <http://fortune.com/worlds-most-admired-companies/>

Apple supplier factories (see Sandoval 2014). In 2014, CLW and Green America (2014) in a joint report on Apple's supplier Catcher Technology Co. Ltd for example found labour rights violations in regard to hiring practices, health and safety, working hours, wages, management, worker representation, student labour and living conditions. The report highlights Apple's continued unwillingness to improve working conditions in its supply chain: "The ongoing and serious labor violations at Catcher bring into question the credibility of Apple's Code of Conduct. Nearly 10 years have passed since Apple unveiled its list of human rights commitments, yet while Apple has earned hundreds of billions of dollars in profit over this period, the workers making Apple's valuable gadgets continue to suffer daily human rights and safety violations" (CLW and Green America 2014, 8)

Clearly, Apple is not an exception and inhumane working conditions persist throughout the supply chain of consumer electronics (see Sandoval and Bjurling 2013). In a recent report on the state of working conditions in the electronics supply chain, Electronics Watch highlights that common problems in the sector continue to include "poor wages; excessive working hours; risky working conditions due to the increase of temporary agency workers; discrimination against student and migrant workers; and a lack of safety precautions for the use of hazardous substances" (Electronics Watch Consortium 2014, 7). High pricing competition in the electronics market, rapid turnover of products, high profit margins for brand companies and the absence of more ethical alternatives to these brands accelerate these problems (Electronics Watch Consortium 2014, 7f).

Apart from shedding light on working conditions in the production of cultural technologies, a cultural materialist perspective also recognises and assesses the environmental impacts of digital culture resulting for example from energy use and electronic waste. Despite its airy and light-sounding label, cloud computing consumes huge amounts of energy worldwide. Greenpeace (2014, 10) calculates that the aggregate electricity demand of cloud computing in 2011 amounted to 684 billion kWh, which is more than the annual national energy consumption of countries such as Germany, Canada or Brazil (Greenpeace 2014, 11).

Apart from greenhouse gas emissions, digital culture is also impacting the environment through the inadequate disposal of increasing amounts of no longer functioning or unwanted cultural gadgets. According to the Solving the e-Waste Problem (StEP) Initiative, 48.9 million metric tonnes of eWaste were produced worldwide in 2012, amounting to 7kg per person on earth⁹. StEP Initiative furthermore calculates that the amount of e-Waste until 2017 will rise by 33 percent to 65.4 million tonnes¹⁰.

⁹ StEP. Overview of Waste Related Information. World. Online <http://www.step-initiative.org/index.php/overview-world.html> accessed on January 29, 2015

¹⁰ StEP. 2013. E-Waste World Map reveals National Volumes, International Flows. Online: <http://www.step-initiative.org/index.php/newsdetails/items/world-e-waste-map-reveals-national-volumes-international-flows.html> accessed on January 29, 2015.

Electronics products can contain up to 60 elements, many of which are toxic (UNEP 2009, 6) such as mercury, lead, cadmium, barium or beryllium. Due to ineffective recycling techniques, limited take-back programmes and illegal exports of e-waste to developing countries, these resources often cannot be extracted for reuse (UNEP 2009, 6). The dismantling of electronics products in the informal recycling sector often results in an uncontrolled release of hazardous substances (e.g. through incineration), which pollute the environment and pose serious health threats to recycling workers and local communities (UNEP 2009, 12).

Waste workers risk being exposed to heavy metals (e.g. lead, cadmium, mercury) as well as various toxic fumes that are released through burning or melting electronic parts, such as toxic dioxin emissions from burning wires insulated with polyvinyl chloride (Maxwell and Miller 2012, 105). As DanWatch reports, exposure to e-Waste can cause cuts, coughs, headaches, upper respiratory problems, rashes and burns as well as long term health conditions including infertility, miscarriage, tumors, endocrine diseases and birth defects (DanWatch 2011, 6).

Looking ahead, the amount of technology used for the production and consumption of culture will increase in the future if the current path of development continues. Research on digital culture should no longer ignore the often slave-like working conditions of miners who are extracting precious metals and minerals, or the lives of often young female migrant workers in China, who are moving to Special Economic Zones for finding employment in a factory to support their families, or the health problems of waste workers on electronic dumping grounds.

An inclusive understanding of cultural labour based on a cultural materialist perspective does not mean to eradicate the distinction between mental and physical labour. Both have distinct qualities and it is still possible and useful to distinguish between physical cultural work and informational cultural work (Fuchs and Sandoval 2014). However, an inclusive perspective has the advantage of not just looking at differences but also commonalities between the mental and physical forms of labour that are needed for the production of (digital) cultural goods. Opening up the discussion on cultural labour thus is a first step for identifying possible moments of solidarity between workers and consumers in the global network of cultural production.

5. Digital culture and global solidarity

The myths that surround digital technology (Mosco 2004; Maxwell and Miller 2012, 7) not only tend to obscure its social and environmental impacts but also the economics of the cultural industry. The business of multinational digital cultural corporations such as Apple or Google depends on combinations of content, designs or software with hardware such as mobile phones, tablets and computers. They exploit diverse forms of both physical and informational labour.

Apple is not just a hardware producer. The success of its gadgets for example evolves around an elaborate integration of design, software and hardware. Likewise, Google is not just handling information. Its business segments include “search and display advertising, the Android operating system platform, consumer content through Google Play, enterprise commerce and hardware products” (Google 2013, 3).

Since 2010 Google has been producing smartphones and tablets under the Google Nexus brand. It has outsourced the manufacturing of its Nexus products to other hardware companies including HTC, Samsung and LG. Motorola Mobility, which Google acquired in 2011 and sold to Lenovo in 2014, organised the manufacturing of the latest versions of Google’s smartphone Nexus 7 and tablet Nexus 9¹¹. However, where and how Google’s hardware is manufactured remains largely obscure. In 2012 Google announced that its Nexus media player would be manufactured in the US (Markoff 2012). In its 2013 annual report Google states “the vast majority of our Motorola products (other than some prototypes) are manufactured outside the U.S. primarily in China and Brazil” (Google 2013, 55).

As Google is keeping its contract manufacturers secret, very little is known about the conditions under which its gadgets are produced. In summer 2013, while Motorola was Google’s subsidiary, SACOM (2013) investigated Biel Crystal’s factory in Huizhou, China, a company, which is supplying electronics brands with cover glasses for phones and tablets. Among its customers are Apple, Samsung and also Motorola. The working conditions SACOM found are similar to those across the electronics manufacturing sector. Workers did not receive clear work contracts, they worked excessive overtime, were exposed to serious health risks, military management styles, unpunctual wages and denial of social security benefits.

However, Google is not only producing smartphones and tablets but according to Wired Magazine since 2000 has also been designing and building its own servers in China and Taiwan (Metz 2012). Chief Financial Officer Patrick Pichette at Google’s annual stockholder meeting in 2012 confirmed “Google actually builds servers in a factory”, stressing that “There’s a bit of a mythology that Google doesn’t know anything about hardware” (Pichette cited in McMillan 2012). Confronting this myth Pichette clarifies: “We’re big in hardware. Google actually builds servers in a factory that actually probably makes us one of the largest hardware manufacturers in the world. And so we know hardware. We know about flash. We know about equipment. We know about supply chain. So we were very well-equipped from the hardware side, to be very competitive in that space” (Pichette cited in McMillan 2012). The example of Google illustrates the complex political economy of digital culture, which pulls together ideational and physical production.

¹¹ BBC. 2014. Google Sells Motorola to Lenovo for \$3bn. Online: <http://www.bbc.co.uk/news/business-25956284> accessed on January 20, 2015.

While Google's corporate power extends across national and occupational boundaries, workers' experiences are predominantly local and separated from each other. This separation limits their ability to confront Google's global power. A worker movement that is based on international solidarity and co-ordinated resistance could create possibilities for challenging Google by simultaneously disrupting several nodes in its transnational production network.

Mosco and McKercher stress: "A more heterogeneous vision of the knowledge-work category points to another type of politics, one predicated on questions about whether knowledge workers can unite across occupational or national boundaries, whether they can maintain their new-found solidarity, and what they should do with it" (Mosco and McKercher 2009, 26). Encouraging solidarity seems crucial in order to reinvigorate a labour movement that over the past decades has been substantially weakened through neoliberal policies, the global fragmentation of production and the normalisation of precarious and flexible work and employment (McGuigan 2010, Mosco 2011, de Peuter 2011, 42). As Mosco (2011) has argued, precarious labour, global exploitation, technological and corporate convergence can only be confronted by a global and inclusive labour movement.

This leads to the key question how to create a sense of solidarity and shared interest between workers whose working lives appear to have little in common. In fact, the differences could hardly seem any bigger between the physically strenuous and dangerous bodily labour of mineral miners and the brain work of well paid software engineers in playful office buildings; the creative labour of designers and the repetitive work routines of assembly line workers; the flexible working hours of digital content editors and dangerous lives of waste workers on electronics dumping grounds; the strictly monitored performance of call centre workers and the prosumer labour in teenage bedrooms etc. Exploring and understanding the particularities of these distinctive forms of work is important. However, keeping alive the possibility of solidarity between the various workers contributing digital cultural production also requires investigating their commonalities.

Let us for example consider manual electronics assembly work and creative content production. One commonality between them is precariousness. The fundamental insecurity and uncertainty (Standing 2011, 10) of precarious labour can be found at various stages of the global digital production network. It affects the worker in an electronics assembly plant without clear work contract who can be fired at any time (Swedwatch and SOMO 2011, 36, SOMO 2009, 30), as well as the web designer who moves from one short-term contract to the next, or the freelance journalist always looking for the next job (Gill 2011, Ross 2006/7, 13, 2008, de Peuter 2011, 419). Feelings of insecurity and anxiety that come with precarious labour neither halt at factory gates nor in front of playful office buildings, home offices, cafes or co-working spaces. Neither do long working hours. While extremely low wage levels often leave electronics assembly workers little choice but to increase their salary through regular overtime work (SACOM 2011a, 9), for a graphic designer it might be the attachment to her products or the passion for her work that compels her to put some extra hours

into an already badly paid project (Ross 2006/7, 28, Gill 2010, Gill and Pratt 2008, 18).

The different reasons for working excessive hours illustrate how capital mobilises the particular needs and desires of different workers while achieving the common goal of maximizing the amount of extracted labour time. Furthermore the dependency of assembly workers on fluctuating orders from brand companies that result in alternate periods of little work and extreme overwork (SACOM 2012, 3) don't seem very different from the "bulimic patterns of working" experienced by many freelance artists, designers or journalists (Gill and Pratt 2008, 14).

Another commonality is the tendency to exploit the badly paid or unpaid labour of interns, who are eager to increase their chances of succeeding within highly competitive labour markets. In a 2014 report the Sutton Trust estimated that at any time 21,000 interns are working for free in the UK. Ball, Pollard and Stanely (2010, 209) in a survey among more than 3,500 graduates in art, design, crafts and media subjects found that 42% were undertaking unpaid work to gain work experience since graduating (Ball, Pollard and Stanely 2010, 209). Badly paid internships are not unique to creative professions. In electronics manufacturing in China hiring student interns is particularly common during peak season to cover the sudden labour demand (SACOM 2012, 6). Students, who often are required to complete an internship as part of their education at a vocational school, are cheaper to employ since they do not receive regular social security benefits and are not covered by labour laws. SACOM's research however shows that like regular workers they are working night shifts and overtime (SACOM 2011a, 18). According to SACOM in 2010 100,000 vocational school students from Henan province were sent to work at a Foxconn electronics factory in Shenzhen to complete a 3-month internship (SACOM 2011b, 3).

Shared experiences of work pressure, anxiety, long hours and exploitation could create a shared interest in co-ordinated resistance grounded in cross-occupation and transnational solidarity. Overall, what unites these workers is that their labour benefits a transnational capitalist class (Sklair 2001) of cultural sector corporations and that they in one way or another are confronted with some form of precarity.

Marx's notion of the collective worker as an "aggregate worker" whose "combined activity results materially in an aggregate product" (1867/1990, 1040), highlights the connectedness of different forms of work. Emphasizing this connectedness he argued that even though "the spreading-out of the work over great areas and the great number of people employed in each branch of labour obscure the connection" the product of each work "is merely a step towards the final form, which is the combined product of their specialized labours" (Marx 1867/1990, 475). Contemporary Marxist theorists have adapted Marx' concepts to global capitalism speaking of the "world collective worker" (*Weltgeamtarbeiter*) (Haug 2009) or the "global worker" (Roth and van der Linden 2009, Dyer-Witthford 2014)

The economic success of companies such as Google or Apple would be unthinkable without either the conceptual work of software engineers and designers, the manual labour assembly plant workers and mineral miners, the support work of call centre workers, unpaid prosumer labour or the care and reproduction work that keeps the corporate engine going. Together they form, a cultural “producer composed of different limbs and organs from around the world” (Lebowitz 2011, 254), the global cultural worker.

6. Conclusions

In this chapter I argued for an inclusive approach to cultural labour in digital capitalism: such a perspective avoids a “cultural idealism” (Williams 1977, 19) that ignores the materiality of culture; takes into account the interconnectedness of technology and content; recognizes the importance of the global division of labour, avoiding Western-centrism; confronts the myth of weightlessness and immateriality of digital culture; is important to acknowledge the environmental and social impact of (digital) cultural industries; and can inform political solidarity.

In addition, considering the totality of digital cultural production on a global scale can confront fetishized and naturalised accounts of the particular form the social division of labour takes in contemporary capitalism. If the critical analysis of (digital) cultural labour wants to go beyond suggesting sectoral improvements for this or that group of workers it needs to problematize the very fact that the relatively privileged creative work of those cultural workers who use digital technologies as their means of production, depends on physically strenuous, repetitive and monotonous labour.

An inclusive approach to digital cultural labour thus culminates in a critique of capitalist digital culture that rests on a complete division between manual and mental labour. Such a division deprives the work of those producing key cultural technologies from its foreseeing and creative elements, which Raymond Williams described as essential qualities of human work: “The specifically human character of work includes [...] not only the foreseeing concept of what is being made but ideally integrated concepts of how and why it is being made. [...] it is reasonable to describe certain forms of human work – those in which the workers has been deprived, by force or by the possession by others of his means and conditions of production, of the necessary human qualities of foresight, decision, consciousness and control – as degraded or sub-human, in no hyperbolic sense” (Williams 1990, 204). Already Marx stressed that “what distinguishes the worst architect from the best of bees is that the architect builds the cell in his mind before he constructs it in wax. At the end of every labour process, a result emerges which had already been conceived by the worker at the beginning, hence already existed ideally” (Marx 1867/1990, 284). Likewise William Morris, a key figure of the 19th century arts and crafts movement, argued that work is only worthy if it makes daily use of creative skills: “Worthy work carries with it the hope of pleasure in rest, the hope of the pleasure in our using what it makes, and the hope of pleasure in our daily creative skills. All other

work but this is worthless; is slaves' work - mere toiling to live, that we may live to toil" (Morris 1888/1973, 88).

Multinational corporations control the production of digital cultural technologies. The organisational form of the value chain allows them to disperse "each value adding activity to geographic locations that optimize labour costs, access to raw materials, or proximity to markets" (Dyer-Witthford 2014, 67) High profit margins are sustained by keeping labour costs at a minimum. Kraemer, Linden and Dedrick (2011) for example calculated that in 2010 Apple kept 58.5% of the sales price of an iPhone, while only 1.8% were spent for the labour cost for final assembly in China. For the iPad Chinese labour costs amounted to 2%, and Apple's profits to 30% of the sales price (Kraemer, Linden and Dedrick 2011, 5). These political economic structures perpetuate degraded and sub-human work in the production of advanced computer technologies that resemble the early days of industrial capitalism.

Further technological progress and automation might help to reduce the amount of repetitive, hard and monotonous labour needed to produce information and communication technologies. Herbert Marcuse for example argued that "the technological progress of mechanization and standardization might release individual energy into a yet uncharted realm of freedom beyond necessity" (Marcuse 1964, 2). However, the way advanced computer technologies are produced today illustrates that realising this potential requires broader social transformations. Marx, who also stressed the potential of technological development to alleviate labour (Marx 1867/1990, 667), realised that the progressive potential of the development of productive forces is constrained by capitalist relations of production: "all the means for the development of production undergo a dialectical inversion so that they become means of domination and exploitation of the producers; [...] they degrade [the worker] to the level of an appendage of a machine, they destroy the actual content of his labour by turning it into a torment; they alienate [*entfremden*] from him the intellectual potentialities of the labour process" (Marx 1867/1990, 799). While technological advancement and further automation is needed to reduce "unworthy work" and "useless toil" (Morris 1888/1973, 88), it is not enough. The transformation of work and the transcendence of exploitation and alienation is thus not a result of "techno-scientific development" alone as theorists of the information revolution claimed, but requires social struggles. A global solidary movement is needed to confront transnational corporate power. Highlighting the connectedness of the various parts of digital cultural production which together compose the global cultural worker is thus essential because, in the words of Nick Dyer Witthford, "To name the global worker is to make a map; and a map is also a weapon" (Dyer-Witthford 2014, 175).

A global solidary movement could evolve around demands for the worldwide reduction of the working week and the introduction of legal minimum wages, a more just distribution of work and division of labour, safe and secure workplaces, the abolition of degraded and inhumane forms of work, the introduction of a guaranteed basic income, worldwide laws against child-labour, ending unpaid internships, universal access to health care, social security

systems that grant both flexibility and security, as well as an expansion of alternative practices that confront exploitation and alienation and strengthen self-determination and democracy at work such as the expansion of collaborative workplaces and worker owned and controlled co-operatives.

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