Theorising and analysing digital labour: from global value chains to modes of production

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Theorising and analysing digital labour: From global value chains to modes of production

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Abstract

This paper considers the following question—where do computers, laptops and mobile phones come from and who produced them? Specific cases of digital labour are examined—the extraction of minerals in African mines under slave-like conditions; ICT manufacturing and assemblage in China (Foxconn); software engineering in India; call centre service work; software engineering at Google within Silicon Valley; and the digital labour of internet prosumers/users. Empirical data and empirical studies concerning these cases are systematically analysed and theoretically interpreted. The theoretical interpretations are grounded in Marxist political economy. The term 'global value chain' is criticised in favour of a complex and multidimensional understanding of Marx's 'mode of production' for the purposes of conceptualizing digital labour. This kind of labour is transnational and involves various modes of production, relations of production and organisational forms (in the context of the productive forces). There is a complex global division of digital labour that connects and articulates various forms of productive forces, exploitation, modes of production, and variations within the dominant capitalist mode of production.

If you explore your apartment, office, public space or means of transportation, it is likely that you see at least one computer, laptop or mobile phone that is connected to the internet. And, it is likely that any given device has a label on it that says one of the following: Acer, Apple, Asus, BenQ, Compaq, Dell, Fujitsu, Hewlett-Packard, HTC, Huawei, Lenovo, LG, Logic Instruments, Motorola, NEC, Nokia, MEDION, Panasonic, Quanta, Samsung, Sony, Sony Ericsson, Toshiba, Wistron, Wortmann Terra, ZTE. When asked 'Where does your computer/phone come from? Who has produced it?' one may, therefore, be tempted to answer, 'Well, it has been produced by company X.' But these companies are merely the actors that sell these devices and profit from the sales. The production process itself contains multiple forms of labour that are invisible to the user. Yet without this labour ICTs would not exist. They are objectifications of complex human labour processes that are organised in an international division of digital labour (IDDL).

This work asks the questions: 'Where does the laptop/computer/mobile phone come from? Who produces it? Which forms of labour are involved?' The arguments presented here are developed

further in the book: *Digital Labour and Karl Marx* (Fuchs, 2014; see also Fuchs and Sandoval, 2014). It analyses and theorises the steps in ICT production processes by discussing specific cases of ICT work: the extraction of minerals in African mines; ICT manufacturing and assemblage in China; software engineering in India; call centre service work; software engineering at Google in the context of Silicon Valley; and the digital labour of internet prosumers/users. The method of analysis entails the presentation of existing empirical data and empirical research results and their theoretical interpretation. The theoretical framing is achieved by applying Karl Marx's modes of production schema to the ICT industry. The various forms of ICT labour that connect the end user to the internet on their phone, PC or laptop involve a multitude of labour forms. They include mineral extraction, hardware manufacturing and assemblage, software engineering, service work and users' productive consumption. All of these labour forms are objectified in a single ICT device. Such devices have a complex spatial and temporal history of production that involves an IDDL, in which different forms of labour create the use-values needed for obtaining a computer or mobile phone. These different use-values, created at different times in different places in different working conditions, become objectified in single ICT devices. This occurs within an international division of labour and articulated modes and forces of production.

According to Jairus Banaji (2011), Marx's theory of the mode of production shows that "capitalist relations of production are compatible with a wide variety of forms of labour, from chattel-slavery, sharecropping, or the domination of casual labour-markets, to the coerced wage-labour peculiar to colonial regimes and, of course, 'free' wage-labour" (Banaji, 2011: 359). This insight helps us to understand the digital media economy because it involves various modes of production and organisations of productive forces. Variations of work within a specific mode of production will be articulated, including slavery in mineral extraction, military forms of Taylorist industrialism in hardware assemblage, informational organisation of the productive forces of capitalism that articulates a highly paid knowledge labour aristocracy, precarious service workers, imperialistically exploited knowledge workers in developing countries, along with highly hazardous informal physical e-waste labour. This paper further argues that the mode of production concept best explains the complexity and global/transnational dimension of digital labour. In contrast, the rather bourgeois notion of a 'global value chain' has less explanatory power.

Marx and Engels on Modes of Production

My approach derives from the Marxist tradition that stresses class contradictions in the analysis of globalisation. In this context, the mode of production concept can be connected to the concept of the new international division of labour (NIDL). An overview of the dimensions inherent to the relations of production and the productive forces are provided in Figure 1.

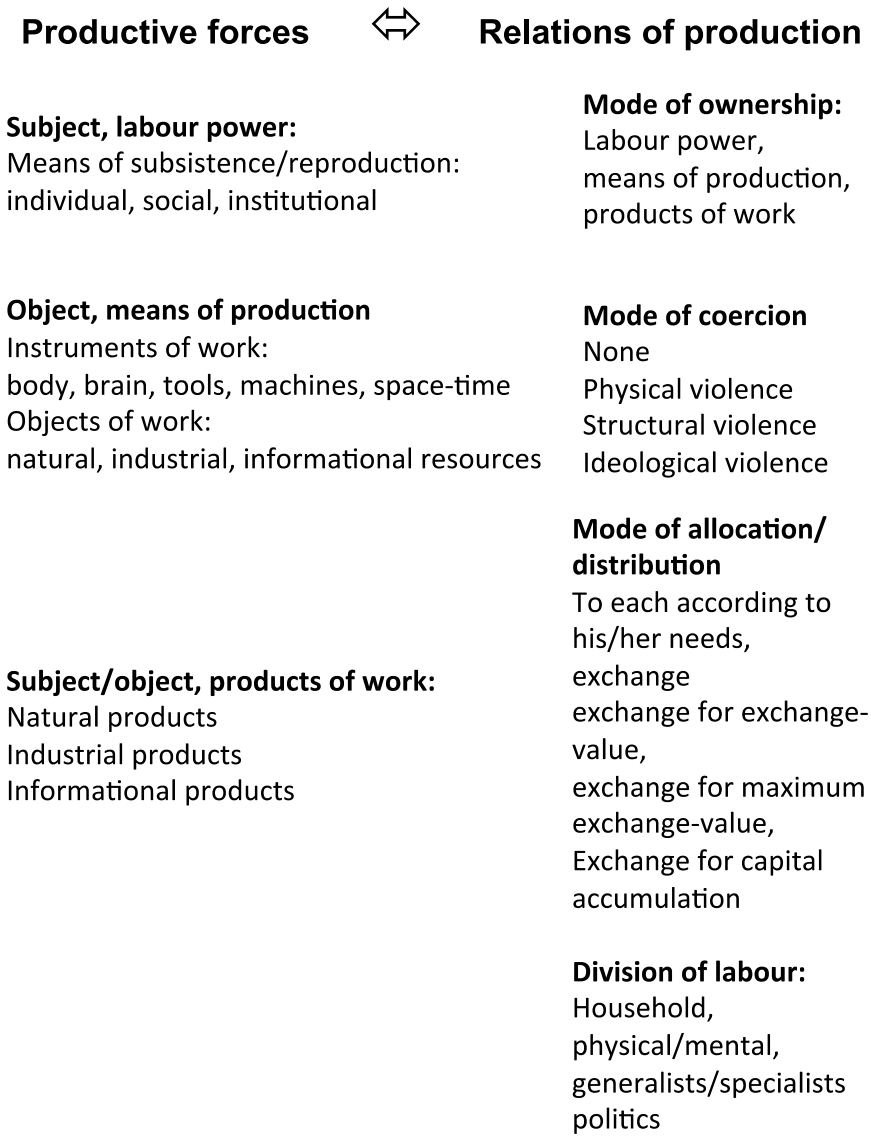

Figure 1. Dimensions of the productive forces and the relations of production

The idea of the mode of production stresses a dialectical interconnection of class relationships (relations of production) with the organisational forms of capital, labour and technology (productive forces). The class relationship determines who owns private property and who has the power to make others produce surplus-value that they do not own. This surplus value is appropriated by private property owners. Class relationships involve an owning class and a non-owning class—the non-owning class is compelled to produce surplus value that is appropriated by the owning class.

The relations of production determine the *property relations* of labour power (who owns which share—full, some, none—the means of production, and products of labour), the mode of allocation and distribution of goods, the mode of coercion used for defending property relations and the division of labour. Class relationships are organisational forms of the relations of production, in which a dominant class controls the modes of ownership, distribution and coercion necessary for the exploitation of a subordinated class. In a classless society, humans have the control of ownership and distribution in common.

Every economy produces a certain amount of goods per year. Specific resources are invested and there is a specific output. If there is no contraction of the economy due to a crisis, then a surplus

product is created, i.e. an excess over the initial resources. The property relations determine who owns the economy's initial resources and surplus. One can distinguish between various modes of production (patriarchy, slavery, feudalism, capitalism, communism) based on various modes of ownership, i.e. property relations (see Table 2).

The *mode of coercion* takes the form of physical violence (overseers, security forces, military), structural violence (markets, institutionalised wage labour contracts, legal protection of private property, etc.) and cultural violence (ideologies that present the existing order as the best possible, or only possible order that obscures the causes of societal problems by scapegoating). In a free society, no mode of coercion is needed.

The *mode of allocation and distribution* defines how products are distributed and allocated. In a communist society, each person gets whatever they require for survival and needs satisfaction. In class societies, distribution is organised in the form of exchange, such that one product is exchanged for another. If you have nothing to exchange because you own nothing, then you cannot get hold of other goods and services, except those that are not exchanged, but are freely available. There are different forms of organisation: general exchange; exchange for exchange-value; exchange for maximum exchange-value; and exchange for capital accumulation.

The *division of labour* defines who conducts which activities in the household, the economy, polity and culture. Historically, there has been a gender division of labour, a division between mental and physical work, and an international division of labour shaped by the globalisation of production. In contrast, Marx imagined a society of generalists that would overcome the divisions of labour. Such a society would be comprised of well-rounded, universally active humans (Marx, 1867/1976: 334f). Marx (1939/1973) says that in class society "labour will create alien property and property will command alien labour" (238). The historical alternative is a communist society and mode of production, in which class relationships are dissolved. The surplus product and private property would be owned and controlled in common.

The relations of production are dialectically connected to the system of productive forces (see Figure 2): human subjects have labour power within a labour process that interacts with the means of production (object). The means of production consists of the object of labour (natural resources, raw materials) and the instruments of labour (technology). In the labour process, humans transform the object of labour (nature, culture) by making use of their labour power in tandem with the instruments of labour. The result is a product of labour, which is, as Marx says, a product, in which labour has become bound up in its object. Labour is objectified in the product and the object is, as a result, transformed into a use value that serves human needs. This is a material expression of Hegel's subject-object relation. Figure 2 summarises the dialectical subject-object process in the economy. The productive forces are a system, in which subjective productive forces (human labour power) make use of technical productive forces, which are part of the objective productive forces. This transforms parts of the natural productive forces (which are also part of the objective productive forces) such that a labour product emerges. The development of the system of productive forces increases the productivity of labour—that is, the output (amount of products) that labour generates per unit of time. Marx (1867/1976: 431) spoke in this context of the development of the productive forces. Another goal of the development of productive forces might be the enhancement of human self-development by reducing necessary labour time and hard work.

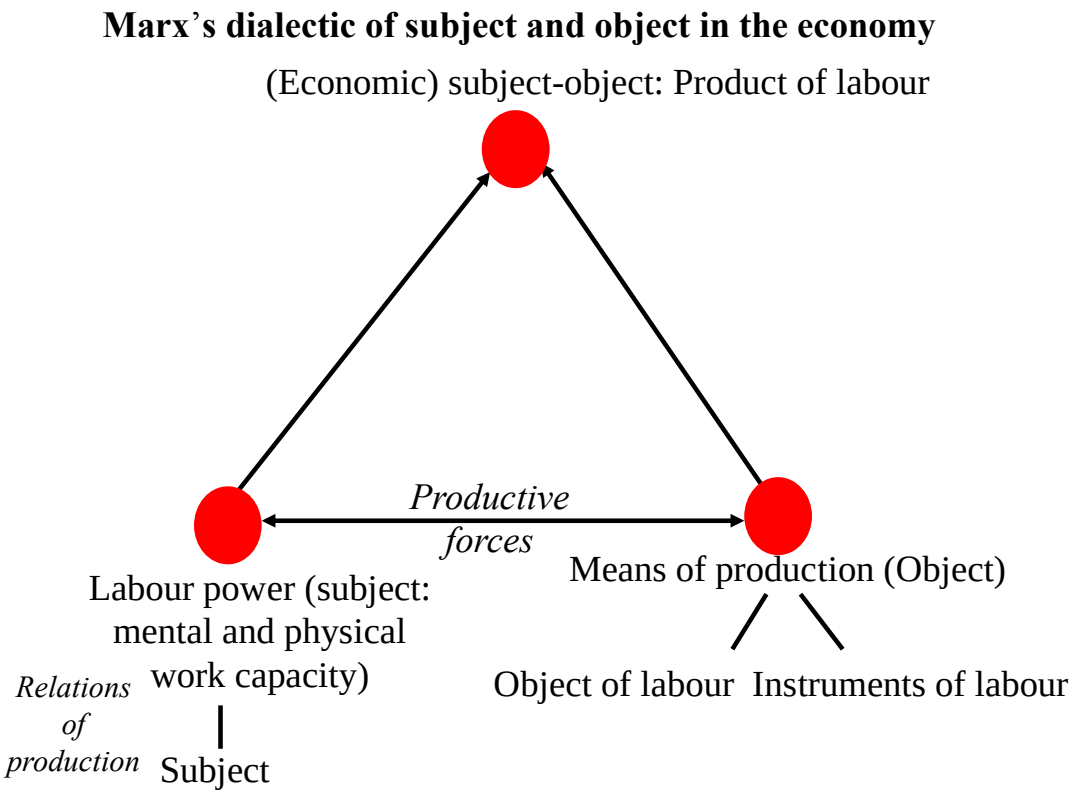

Figure 2. The dialectical triangle of the work process: Productive forces and the labour process as dialectical subject-object

The instruments of work can be the human brain and body, mechanical tools and complex machine systems. They also include specific organisations of space-time. This incorporates specific locations of production that are operated over specific time periods. The most important aspect of time is the necessary work time that ensures productivity and the survival of society over a given year. The objects and products of work can be natural, industrial, informational or a combination thereof.

The productive forces are systematically organised to create use-values. There are different modes of organisation of the productive forces, such as agricultural productive forces, industrial productive forces and informational productive forces. Table 1 gives an overview.

Mode	Instruments of work	Objects of work	Products of work
Agricultural productive forces	Body, brain, tools, machines	Nature	Basic products
Industrial productive forces	Body, brain, tools, machines	Basic products, industrial products	Industrial products
Informational productive forces	Body, brain, tools, machines	Experiences, ideas	Informational products

Table 1. Three modes of organisation of the productive forces

Classical slavery, serfdom and wage labour are three important historical forms of class relations that are at the heart of specific modes of production (Engels, 1884/1942). Marx and Engels argue that slavery and private property are family-based. The first historical form of private property can be found in the patriarchal family (Marx and Engels, 1932/1976: 52). It is a mode of production in which labour power is not a commodity, but organised through personal and emotional relationships. These result in certain commitments, including family work that is unremunerated. This, in turn, contributes to the reproduction of the human mind and body as well as broader social relations. It can therefore also be called reproductive work.

A wage worker's labour power has a price, namely its wage, whereas a slave's labour power does not have a price as it is not a commodity. However, the slave him-/herself has a price, which means that their entire human body and mind can be sold as a commodity from one slave owner to another. The current slave owner commands the entire life time of the slave (Marx, 1939/1973: 288f). The slave in both ancient slavery and feudalism is treated like a thing and has the status of a thing (Marx, 1939/1973: 464f).

In the *Grundrisse*'s section "Forms which precede capitalist production" (Marx, 1939/1973: 471ff) as well as in the *German Ideology's* section "Feuerbach: Opposition of the materialist and idealist outlooks" (Marx and Engels, 1932/1976), Marx discusses the following modes of production:

1. The tribal community based on the patriarchal family;
2. Ancient communal property in cities (Rome, Greece);
3. Feudal production in the countryside;
4. Capitalism.

Table 2 provides a classification of modes of production based on the dominant forms of ownership (self-control, partly self-control and partly alien control, full alien control).

	Owner of labour power	**Owner of the means of production**	**Owner of the products of work**
Patriarchy	Patriarch	Patriarch	Family
Slavery	Slavemaster	Slavemaster	Slavemaster
Feudalism	Partly self-control, partly lord	Partly self-control, partly lord	Partly self-control, partly lord
Capitalism	Worker	Capitalist	Capitalist
Communism	Self	All	Partly all, partly individual

Table 2. The main forms of ownership in various modes of production

How are modes of production related to each other? This question has two answers: modes of production are related in an historical way such that they supersede each other, or in a historical-logical way within a specific social formation that sublates older formations but encompasses older modes of production into itself. Banaji (2011) argues that Stalinism and vulgar Marxism have conceptualised the notion of the mode of production based on the assumption that a specific mode contains only one specific historical form of labour and surplus-value appropriation. Previous modes are eliminated such that history develops in the form of a linear evolution: slavery => feudalism => capitalism => communism. For example, Althusser and Balibar (1970) argue that the historical development of society is non-dialectical and does not involve sublations, but rather transitions "from one mode of production to another" (Althusser and Balibar, 1970: 307). In other words, one mode succeeds the other. This concept of history is one of the reasons why E. P. Thompson has characterised Althusser's approach as "Stalinism at the level of theory" (1978: 131). The Stalinist "metaphysical-scholastic formalism" (Banaji, 2011: 61) has been reproduced in liberal theory's assumption that there is an evolutionary historical development from the agricultural society to the industrial society to the information society so that each stage eliminates the previous one (Bell, 1974; Toffler, 1980). According to Banaji, capitalism often intensified feudal or semi feudal production relations. In parts of Europe and outside, feudalism would have only developed as a "commodity-producing enterprise" (Banaji, 2011: 88). In the Islamic world, capitalism would have developed without slavery and feudalism (Banaji, 2011: 6).

Banaji advances, in contrast to formalist interpretations, a complex reading of Marx's theory, in which a mode of production is "capable of subsuming often much earlier forms" (Banaji, 2011: 1). He also notes that "similar forms of labour-use can be found in very different modes of production" (Banaji, 2011: 6). In other words, capitalism is "working through a *multiplicity* of forms of exploitation" (Banaji, 2011: 145) and is a combined form of development that integrates "diverse forms of exploitation and ways of organising labour in its drive to produce surplus value" (359).

A mode of production is a unity of productive forces and relations of production (Marx and Engels, 1932/1976: 91). If these modes are based on classes as their relations of production, this generates specific contradictions that result in the sublation (Aufhebung) of one mode of production and the emergence of a new one. The emergence of a new mode of production does not necessarily abolish, but rather sublates (aufheben) older modes of production. This means that history is for Marx a dialectical process deriving from Hegel's threefold meaning of the term Aufhebung (sublation): uplifting, elimination, preservation. There are new qualities of the economy—the dominance of an older mode of production vanishes, but this older mode continues to exist in the new mode in a specific form and relation to the new mode. Thus, the rise of capitalism did not bring

an end to patriarchy; the latter continued to exist in such a way that a specific household economy emerged to effect reproduction of modern labour power. A sublation can be more or less fundamental. A transition from capitalism to communism requires a fundamental elimination of capitalism. The question is, however, is this immediately possible? Elimination and preservation can take place to differing degrees. A sublation is also no linear progression. It is always possible that relations that resemble earlier modes of organisation are created.

Capitalism operates at the level of the relations of production organised around relations between capital owners on the one side and paid/unpaid labour and the unemployed on the other. On the level of the productive forces, it has developed from industrial to informational productive forces. The informational productive forces do not eliminate, but sublate (aufheben) other productive forces (Adorno, 1968/2003; Fuchs, 2013). In order for informational products to exist, a lot of physical production is needed. This includes agricultural production, mining and industrial production. The emergence of informational capitalism has not virtualised production or made it weightless or immaterial. Information capitalism is grounded in physical production (Huws, 1999). Whereas capitalism is a mode of production, the terms 'agricultural society', 'industrial society' and 'information society' characterise specific forms of the organisation of the productive forces (Adorno, 1968/2003; Fuchs, 2013).

I suggest that the Marxist notion of the mode of production is a more useful concept for the analysis of digital labour than that of the global value chain. Michael Porter (1985) defined the value chain as "a collection of activities that are performed to design, produce, market, deliver and support its product" (Porter, 1985: 36). The term value chain has become a popular category for analysing the organisation of capital. This is indicated by the fact that, as of May 21st, 2013, 11,682 articles indexed in the academic database Business Source Premier contained the term in their abstract. The term has also been used in mainstream media economics for the analysis of traditional mass media and ICTs (see Silverstone et al., 2000: 126–135). The problem with the mainstream use of the value chain concept is that it focuses on the stages in commodity production and tends to neglect working conditions and class relations. Interestingly, also, critical scholars have used the notion of the global value chain (see for example Huws, 2008; Huws and Dahlmann, 2010).

In the 1980s, critical scholars introduced the notion of the new international division of labour (NIDL):

> "The development of the world economy has increasingly created conditions (forcing the development of the new international division of labour) in which the survival of more and more companies can only be assured through the relocation of production to new industrial sites, where labour-power is cheap to buy, abundant and well-disciplined; in short, through the transnational reorganization of production." (Fröbel, Heinrichs and Kreye, 1981: 15)

A further development is that "commodity production is being 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 et al., 1981: 14). In critical media and cultural studies, scholars have used the new international division (NICL) of labour concept to explain the international division of cultural labour (Miller et al., 2004). The NIDL concept has the advantage of stressing the class relationship between capital and labour. From a NIDL perspective, the processes of class struggle capital tries to increase profits by decreasing its overall wage costs

through the global diffusion of the production process. The concept also encompasses workers' struggles against the negative effects of capitalist restructuring

Marx and Engels (1932/1976) considered the division of labour not as a separate holistic concept, but as related to the mode of production. They especially emphasised the division of labour between men and women in the household, citizens and slaves, the town and the countryside, branches of the economy, labour in industry and commerce, intellectual and physical labour and centres and colonies as sources of raw materials. The NIDL organises the labour process in space and time in such a way that specific components of the overall commodity are produced in specific spaces in the global economy. These components are reassembled in order to form a coherent whole that is sold as a commodity. The NIDL indicates the social relation between different forms of labour required in the production process at a global level.

The following sections will analyse various forms of exploitation in the global production of digital media. These forms of exploitation will be at a global level related to specific modes of production and the organisation of productive forces.

Slave Mineral Workers and the NIDL

African countries (Democratic Republic of Congo (DRO), Ethiopia, Mozambique, Rwanda, South Africa, Zambia, and Zimbabwe) are among the largest producers of minerals needed for ICTs, yet they hardly figure among important importing countries (Pöyhönen and Simola, 2007; Steinweg and de Haan, 2007; United States Geological Survey, 2012). This is an indication that the production and use of ICTs is based on a division of labour which positions Africa as an important and relatively cheap source of natural resources (cheap because of highly exploited labour). These resources are further processed in non-African countries, especially China. In the NIDL, Africa is a highly exploited economic colony. And this colonial status, as will be shown, is based on the exploitation and enslavement of African workers. Marx has argued that colonies are a form of primitive accumulation (Marx, 1867/1976: 916). The contemporary existence of economic colonies shows that primitive accumulation is a continuous process that capitalism uses for getting hold of resources and labour such that investment costs are minimised and exploitation is intensified. The minerals required for ICTs are mostly extracted in Africa and China, whereas the smelting, refinement and enrichment of them often takes place in Asian countries such as Thailand, Malaysia, China and Indonesia. Factories in these countries usually supply the electronics markets (Pöyhönen and Simola, 2007: 37).

In 2011, the DRC produced 53% of the world's cobalt, 2.3% of the world's tin and around 10% of the world's tantalum (Eichstaedt, 2011: 140; United States Geological Survey, 2012). The DRC is the world's largest producer of cobalt and a significant producer of coltan and tin. The demand of Western companies for cheap minerals has been an important driver of the violence, slavery and exploitation in Eastern DRC. The DRC has, since the 1990s, been haunted by wars that have killed millions of people. The poverty and violence the country experienced forced people to do whatever was necessary in order to survive. This created conditions for the existence of modern forms of slavery. In the DRC, the mining that is relevant for the ICT industry involves tin-ore cassiterite, tantalum-ore coltan (that is by refinement transformed into the metal tantalum), wolframite and gold (Pöyhönen et al., 2010). These minerals are used as raw materials in the production of cellphones, laptops, light bulbs and cars (Leslie et al., 2011). Many mines in the DRC are either controlled by

armed government forces, namely Forces Armées de la République Démocratique du Congo (FARDC) or rebel armies.

Empirical research conducted for the Free the Slaves (2011) report focused on interviewing workers in the Bisie and Omate mines as well as mining workers in Walikale and Masisi. In total, 742 interviews were carried out. The study found that slavery is widespread in the mining industry, including work digging, sorting, transporting and the sale of minerals. This is also the case in occupations that provide services to miners, such as domestic servants, bar workers and sex workers. Forty percent of the respondents were from the Bisie mine (Leslie et al., 2011), where 80% of the DRC's tin/cassiterite is mined (Eichstaedt, 2011: 121). They worked under conditions of slavery. This circumstance shows that the informational productive forces of capitalism that create digital media are to a certain extent coupled to the slave mode of production in developing countries in order to reduce labour costs and maximise profits.

Researchers documented *forced labour*, whereby the government-FARDC soldiers forced villagers to work in the Bisie mine without payment, under the threat of being killed if they were to flee. Also a system called 'salongo' was documented, in which all mine workers on a particular day of the week had to work for one FARDC official (Leslie et al., 2011: 13). Marx (1861–1863/1988–1991) described this system as corvée labour, in which the days and times worked for the Lord can be categorised as surplus labour or necessary labour. Another system found in East DRC was for miners to pay a weekly rent to mine controllers and the government in order to work in a specific mine (Nest, 2011: 43). They extract tin and have to pay fees to their armed employers for mining and leaving the mine (in order to sell the extracted minerals). The imposed fees are so high that the workers cannot ever get out of the working relation in which they are trapped—in short, they are slaves (Poulsen and Tornbjerg, 2011: 41:15). In the DRC's mining industry, both the classic form of slavery as well as feudal slavery based on rent and corvée slavery exist. In wage-labour, the worker is doubly free, i.e. 'free' to sell their labour power and 'free' from the ownership of means of production and the products of labour, and sells their labour power as a commodity for the whole working week. In classic slavery, the slave is unfree and a property of the slave-owner for the entire working week. In the corvée system, the worker is a slave for part of the working week, whereas the rest of the week is free for other activities that are needed to earn a living. In the Free the Slaves (2011) study, a significant number of respondents faced debt bondage slavery. Here, money is borrowed at very high interest rates, which forces the debtors to work in a mine. There are fraud schemes that "make it impossible to pay off the debt" (Leslie et al., 2011: 14). Also, peonage slavery was documented. In this form of slavery, a person is arrested under some charges that are mostly made up and then told that the sentence is mine work. Eighty nine percent of the interviewed children (N=31) were living in and working under conditions of slavery. In the DRC, 75% of the miners cannot cover basic needs with their wage (Pöyhönen and Simola, 2007: 29).

The tragedy of the DRC is that a country that is rich in mineral resources has experienced one of the bloodiest conflicts in the world during the 20th and 21st centuries. This conflict is directly connected to the West and the Western ICT industry. In 2011, the DRC was the least developed country in the world and had a very high inequality rate (Gini) of 44.4%. Just over 59.2% of the population lived in extreme poverty on less than $US 1.25 per day and the life expectancy was 45 years (United Nations Development Programme, 2011). War and neo-imperialist exploitation of labour and natural resources at the expense of local people has created the paradox typical for capitalism. Here is a country that is one of the richest in natural resources. It has 45% of the world's cobalt reserves, 25% of the world's diamond reserves (United States Geological Survey, 2012) and,

according to estimates, between 7–8% (Nest, 2011: 18–20) and 64% (Gootnick, 2008) of the world's coltan reserves. Yet, the DRC is socially the world's poorest country.

Foxconn: ICT Assemblage in China

Hon Hai Precision (also known as Foxconn) is a Taiwanese company that was the 156th largest company in the world in 2012 (Forbes, 2012). According to CNN Global 500 (2012), Foxconn is the fifth largest corporate employer in the world. In 2011, Foxconn had enlarged its Chinese workforce to one million people, with a majority being young migrant workers from the countryside (Students & Scholars Against Corporate Misbehaviour (SACOM), 2011a, b). Foxconn assembles the iPad, iMac, iPhone, Kindle, and various consoles (by Sony, Nintendo, Microsoft). Its customers are Western companies such as Apple, Dell, HP, Motorola, Nokia, Sony, and Sony Ericsson (SACOM, 2010: 4).

Seventeen Foxconn workers attempted to commit suicide between January and August 2010. Students and Scholars against Corporate Misbehaviour (SACOM, 2010) conducted a study in which 100 Foxconn workers in Shenzhen and Hangzhou were interviewed and observed. In June 2010, the basic wage of Foxconn Shenzhen workers was CNY (Chinese Yuan Renminbi) 1,200 per month. SACOM (2010) calculated that the living wage needed for surviving in Shenzhen should be CNY 2,293. With more than 420,000 workers, Shenzhen is Foxconn's largest factory (SACOM, 2010: 10). In 2008, Foxconn Guanlan workers on average worked 120 hours overtime per month (SACOM, 2010: 7). Tian Yu, a 17 year-old girl who survived an attempted suicide, reports that at Foxconn Longhua she had to work from 7am to 7pm (Qiu, 2010). SACOM (2010) also documented frequent work shift changes, regular working periods of over 10 hours per day, a lack of breaks, monotonous work, physical harm caused by chemicals such as benzene or solder paste, lack of protective gear and equipment, forced use of students from vocational schools as interns on assembly lines (in agreement with the school boards) and prison-like accommodation with 6–22 workers per room (SACOM, 2011a: 18). In each dormitory, workers did not know each other. Unions were managed by company officials whom the workers did not trust. In 2011, SACOM conducted interviews with 120 workers in Shenzhen, Chengdu and Chongdinq to test if working conditions had changed a year after the Foxconn suicides. The poor working conditions documented in the previous study were confirmed. In 2012, SACOM (2012) conducted a follow-up study comprised of 60 interviews with workers in Zhengzhou, which again confirmed the previous results. SACOM (2010) had documented harsh management methods, including a lack of breaks, a prohibition that workers move, talk or stretch their bodies, requirements to stand during production, as well as punishments, beatings and harassment by security guards. The Fair Labor Association (2012) conducted a survey with 35,166 respondents who were employees in Foxconn Chengdu, Guanlan and Longhua. Just over 64% of the respondents thought that their salaries did not cover basic needs. Workers were asked what three things they would change if they had the chance to: salaries were the top priority, followed by benefits/allowances, food quality and working hours. Only 22.1% said that they were union members.

Just over 72% of the respondents were migrant workers. According to official statistics, there were 252.78 million migrant workers in China in 2011, an increase of 4.4% compared to 2010 (National Bureau of Statistics of China, 2012). Rural poverty is the basic reason for the Chinese young rural population migrating to urban areas (see Hong, 2011: Chapter 5; Qiu, 2009: Chapters 4 and 6). In the period 2001–2005, 40 million landless peasants were created by the government

appropriation of rural land, which reinforced migration into the cities (Hong, 2011: 204). What is happening to Chinese peasants is exactly what Marx (1867/1976) referred to as the process of primitive accumulation. This started in Europe in the 15th and 16th centuries. According to Marx, primitive accumulation creates an "incomparably larger proletariat by forcibly driving the peasantry from the land. […] and by usurpation of the common lands" (Marx, 1867/1976: 878).

The 2010 SACOM report concluded: "In order to maximize productivity, workers at Foxconn are made to work like machines" (SACOM, 2010: 10). Marx (1867/1976) describes the methods whereby capitalists try to organise the working day in order to accumulate ever more profit. Absolute surplus-value production, which is characteristic of what Marx (1867/1976: 1019–1023, 1025–1034) terms the formal subsumption of labour under capital, means that workers work more hours unpaid because the working day is prolonged. Relative surplus-value production is characteristic for the real subsumption of labour under capital (Marx, 1867/1976: 1023–1025, 1034–1038). Here, working time remains the same, but work becomes more productive and undergoes a speed-up so that more surplus value is produced.

The analysed reports make clear that in Foxconn factories, absolute methods of surplus value production are used primarily to increase profits. One finds in these factories unpaid overtime, hardly any breaks, long working days of up to 12 hours, working weeks with 6 working days, and work without a day off for up to 2 weeks at a time. A certain wage is paid, but the management strategy is to press for maximum hours of work out of the workforce. The reports also show that absolute surplus-value production is to a certain, although lesser degree combined with relative surplus-value production. The military system of worker surveillance and coercion uses drill, control and punishment aimed at disciplining them such that they not only work long hours without breaks, but also work in an intense manner. They must produce as many items per hour as possible. Foxconn is typical of the Chinese ICT industry, in which, as Yu Hong argues, the "FDI-driven and outward-looking mode of ICT development has created a new working-class stratum who are regionally clustered, largely peasant-based, semi-skilled, low-wage, irregularly employed, and mostly female manual workers" (Hong, 2011: 113). China has "the largest exploited working class of the global information age" (Castells, in: Qiu, 2009: x).

Work in the Indian Software Industry

After the assassination of Indira Gandhi in 1984, Rajiv Gandhi became the new Indian prime minister and substituted the politics of techno-nationalism by politics that enabled the deregulation of the computer industry, the attraction of foreign capital and an orientation toward Indian ICT exports (Chakravartty, 2004; Upadhya and Vasavi, 2008). In the years 2000–2009, the export orientation of the Indian software industry increased markedly (Papola, 2012; National Association of Software and Services Companies (NASSCOM), 2012). In 2010, software services accounted for 54.4% of all exported services in India (Ministry of Finance, 2011: 166). In 2011, the figure increased to around 58% (NASCOMM, 2012). Although the Indian software industry has had a huge growth rate and a large share of exports in services, it accounted for only 0.5% of the total Indian labour force in 2009 and 0.6% in 2012 (NASSCOM, 2012; Papola, 2012). India is the second largest country in the world (following China) and its mere size provides an attractive location for the outsourcing of ICT services for Western companies. Their objective is to increase profit rates by decreasing overall wage costs. Between 2009 and 2012 India's overall employment

growth was modest. Yet, according to estimates, the Indian software sector accounted for 7.5% of the Indian GDP in 2012 (NASCOMM, 2012).

D'Costa (2002) argues that Indian software development is embedded within an uneven development pattern that produces winners and losers and develops some regions, cities and groups at the expense of others. Ilavarasan's (2007) empirical research concludes that the Indian ICT workforce has large urban-rural and gender differences and that these differences contribute to uneven development in India. Commander et al. (2008) conducted a survey among 225 Indian and 60 US software firms. The average wages in Indian software companies were calculated at 9.6% of the wages across US software firms. Consequently, "The single greatest motivation for considering India for offshoring from a developed country is lower labor costs" (Dossani and Kenney, 2007: 777).

Ilavarasan (2007) conducted a survey of 114 respondents and undertook 62 interviews in two large Indian software companies. He found that most employees have flexible working times and that they often work during the night. Fifty six percent said that they also work on holidays and 86% said that they were not paid for overtime. Actual working hours per week would be far more than the 40 hours that are formally required. Indian ICT workers are "'high tech' nomadic" workers (Upadhya and Vasavi, 2008: 20). The phenomenon of "global body shopping" is a "uniquely Indian practice whereby an Indian-run consultancy (body shop) anywhere in the world recruits IT workers, in most cases from India, to be placed out as project-based labor with different clients" (Biao, 2007: 4; see also Aneesh, 2006). Indian ICT workers also perform support tasks for American companies when it is night in the US and daytime in India (Aneesh, 2006).

A neoliberal programme of liberalisation, deregulation and privatisation has characterised India. Arundhati Roy (2003: 2) says in this context that India "is currently at the forefront of the corporate globalization project. […] corporatization and privatization are being welcomed by the Government and the Indian elite". The software industry has become, in the neoliberal policy framework, a strategic economic focus; its deregulation, export-orientation and attraction of foreign capital investment has created a specific form of capital accumulation in India.

Lenin (1917/1966) has characterised capital export as an important feature of imperialism**:** "Under modern capitalism, when monopolies prevail, the export of capital has become the typical feature" (Lenin, 1917/1966: 215). The goal would be to achieve high profits by exporting capital to countries in which "capital is scarce, the price of land is relatively low, wages are low, raw materials are cheap" (Lenin, 1917/1966: 216). Exploiting labour in colonies with high exploitation rates can be achieved by military means (annexation of a country) and/or by economic means. David Harvey (2003) characterises the contemporary new imperialism as a form of accumulation by dispossession. In the Indian software industry, this takes on a specific economic form whereby capital controls the industry and pays comparatively low wages by international standards (which is supported by the deregulation of the sector). This arrangement thereby achieves high returns because Indian software engineers' wages are less than those of their US equivalents. Western companies can maximise profits by outsourcing software engineering to India or by temporarily employing Indians in the US or other countries. Most of the value created by Indian software engineers does not stay in the country and does not benefit all. Instead, it is appropriated and owned by Western capital. Thus, Western capital sells software that is based on the dispossession of the value created by Indian software engineers in such a way that high exploitation rates are given. The Indian software industry is part of an IDDL that is shaped by a new imperialism that requires a very high rate of exploitation such that value from India is exported to Western countries. As a result,

there is an uneven global development in the ICT industry and the creation and amplification of an uneven development within India. Marx wrote of India that the "aristocracy wanted to conquer it, the moneyocracy to plunder it, and the millocracy to undersell it" (Marx, 1853/1979). Contemporary forms of neo-imperialism are still based on the exploitation of colonies. Western capital acts as "moneyocracy" that plunders India and other countries in the global south. This plunder takes on a specific form. The Indian software industry is a strategic industry in the new imperialistic IDDL. Just as Marx wrote in 1853, most Indians do "not reap the fruits of the new elements of [the information] society (Marx, 1853/1979: 18)".

Call Centre Work

The Global Call Center Project (http://www.ilr.cornell.edu/globalcallcenter) is a research network that has studied call centre work in 20 countries. The project conducted a survey that covered 2,500 call centres in 17 countries. Women accounted in total for 69% of the employees (Holman et al., 2007). In coordinated economies, the median annual pay of a call centre agent was $US23,599, in liberal economies $US32,925 and in industrialising countries $US19,105. The median turnover rate of personnel was 20%. Call centres extensively use call monitoring and software for call performance metrics (Holman et al., 2007: 9–10). The study found that 39% of the analysed call centres have low to very low quality jobs with relatively low job discretion and relatively high performance monitoring. More specifically, 36% of the employees have very low quality jobs, 67% low to very low quality jobs and only 14% high or very high quality jobs. In general, the Global Call Center Project found a high level of standardisation of call centre jobs, high performance monitoring, low level of employee influence on decisions about the work process, low job quality and a high rate of female employment.

Zillah Eisenstein (1979) argues that the gender division of labour that shapes capitalist patriarchy assigns five types of labour to women: reproduction, child-rearing, maintenance of home, sexuality and organisation of consumption (33). Call centre labour shows that the gender division of labour extends from the home into the capitalist workplace. In the home, women are compelled to take care of biological reproduction and child-rearing. In call centre work, this role is reproduced because a patriarchal ideology is at play that sees women as being, social, friendly and caring not just for children and the family in the home—but also for customers on the phone. The activity of keeping constant order in the home gets reproduced in the call centre. Women employees are assigned the task of keeping order in the customer database so that the clients keep on buying the offered commodities. In the household, patriarchy assigns women the role of organising family consumption—buying and preparing food and being aware of the new consumer goods that could improve family life. In the call centre, workers are also in charge of organising consumption— they respond to the consumer needs of customers and help them to fix problems that relate to consumption and the improvement of the consumption experience. Last, but not least, sexual work and desire gets reproduced from patriarchal relations to the call centre. Talking to a woman at the customer service may engage the sexual desires of male callers. Just like the telecommunicated form of prostitution (paid phone sex), call centre work indirectly provides sexual allure for men. The female call centre agent will sell services to men more easily if they are implicitly reminded of the sexual connotations associated with women on the phone. All five types of housework that Eisenstein identifies—reproduction, child rearing, maintenance of home, sexuality and organisation of consumption get reproduced in the call centre. It is therefore no surprise that the majority of call

centre agents are female. Capitalism uses the patriarchal assumptions that women are social, caring, affective, sexual, relational and communicative to create precarious employment relations. In call centres, as in the home, "the biological distinction male/female" is ideologically used "to distinguish social functions and individual power" (Eisenstein, 1979: 17). And, the position of employees "as paid workers is defined in terms of being a woman" (Eisenstein, 1979: 30).

Like housework, call centre work relies on workers' temporal availability and flexibility as defined by others. Houseworkers often have to be available around the clock for children and the whole family. Call centres tend to be open 24 hours, which requires around the clock availability from the collective call centre worker. This can bring problems for health and family life. The call centre agent's work (insecure, precarious, stressful and standardised) requires spatio-temporal flexibility defined by capital's needs. This has become the model for an entire economy of insecure work that especially affects young people's lives. Cutting labour costs by casualisation is a form of absolute surplus-value production—the part of the day that produces surplus-value and profit is lengthened. Ideology defines women as working mothers in order to pay them less than men.

Call centre work is highly monitored and standardised—it is a kind of Taylorist white-collar work that blurs traditional blue collar-white collar distinctions. The standardisation and surveillance of work, accompanied by precariatisation that puts workers under survival pressures, is a method of relative surplus value production. Constant control and pressure is aimed at making workers discipline their brains and bodies such that they work more intensively. They will take care of more customers in less time and so increase productivity. Call centre work is characterised by the formal and the real subsumption of labour under capital. The methods of absolute surplus value production (cutting wage costs) and relative surplus value production (standardisation, surveillance, grey collar Taylorism) are used for advancing capital accumulation.

Software Engineering at Google: The Silicon Valley of Nightmares

Silicon Valley is located in the Santa Clara Valley, south of San Francisco. In 2011, the average wages of employees in the software industries there, specifically for other computer-related services, were two times higher than the general US wage average. And, Silicon Valley wages in the areas of internet publishing and web portals, were 5.6 times higher than the general US wage average (data source: US Bureau of Labor Statistics: Quarterly Census of Employment and Wages).

What do working conditions look like in knowledge-intense jobs, such as software engineering? To answer this question, we need to look at labour in one of Silicon Valley's most well-known companies—Google. In 2011 their profits were US$9.74 billion, the largest amount since the company's creation in 1998 (data source: Google SEC Filings: Annual Report 2011).

For this article, I analysed job reviews for Google that contained a job title related to the keyword 'software'. This resulted in a total of 307 postings from Glassdoor that were written between February 5, 2008, and December 15, 2012. In addition, I analysed a thread on reddit that asked people to report anonymously on working conditions at Google (http://www.reddit.com/r/AskReddit/comments/clz1m/google_employees_on_reddit_fire_up_your_throwaway/). I searched for and analysed postings in which workers talked about working time issues. This resulted in a sample of 75 postings, 10 from the reddit thread and 65 from Glassdoor. Fifty eight postings mentioned the negative aspects of working at Google. The issue that all of these 58 postings focused on were long working hours and the consequent effects on work-life-balance. The picture that emerges from the analysis is that people tend to work long hours at Google, and

they feel that the nice working environment that features free food, sports facilities, restaurants, cafés, events, tech-talks and other perks encourages employees to stay and work longer. Working long hours is not a formal management expectation, rather it is built into the company culture so that there is a lot of competitive peer-pressure to work long hours. One tends not to have enough time to work on one's own projects. In order to do so, hours were added to the work time for Google.

In the early capitalism that Marx describes in *Capital, Volume 1*, the lengthening of the working day was achieved by control, surveillance, disciplinary measures and by state laws. The price was an increase in class struggles that pressed for reducing working hours. Googles main way of increasing surplus value production also entails absolute surplus value production, i.e. the lengthening of the working day. However, Google takes a different approach; the coercion is ideological and social. It is built into the company's culture of fun, playbour (play labour), employee services and peer pressure. The result is that the total average working time and unpaid working hours per employee tend to increase. Marx would describe this case as a specific method of absolute and relative surplus value production, in which the productivity and intensity of labour remain constant, whereas the length of the working day is variable (Marx, 1867/1976: 663).

In comparison to Californian semi-conductor processors, who in 2012 earned on average US$36,584, the then average wage of a Google software engineer was US$112,915 or 3.1 times higher. For the same year, Californian electronic equipment assemblers earned an average wage of US$33,179. A Google software engineer earned, on average, 3.4 times more [data source: glassdoor.com, January 13, 2013). These figures show that there is a significant wage gap in the ICT industry between assemblers and software engineers. There is high wage inequality between professionals (especially managers) on the one hand, and manufacturing workers on the other (Benner, 2002; Carnoy et al., 1997). Whereas white people constitute a large share of officials, managers and professionals, Hispanic and Asian employees make up the large share of semi- and unskilled production and service workers in Silicon Valley (Benner, 2002; Pellow and Sun-Hee Park, 2002). Pellow and Sun-Hee Park (2002) analysed the working conditions in Silicon Valley's ICT manufacturing industry. They show that the wealth of this industry and its beneficiaries is linked to the "hyperexploitation of undocumented and documented persons by employers" (Pellow and Sun-Hee Park, 2002: 6). Furthermore, toxic workplaces are highly gendered and racially structured. Toxic substances have frequently been released into the workplace. Contamination of the air, soil and drinking water have resulted in cancer, respiratory diseases and reproductive problems for women such as miscarriages and birth defects.

There is a significant wage gap in the ICT industry between assemblers and software engineers. Both types of labour are exploited and necessary for capital accumulation. Software engineers at Google (and other companies) form what Engels termed the 'labour aristocracy'. Writing in 1885 about working conditions, Engels (1892/1953: 20) noted that there were workers whose "state of misery and insecurity in which they live now is as low as ever". But he also observed that there was also "an aristocracy among the working-class" (engineers, carpenters, joiners, bricklayers) that has "succeeded in enforcing for themselves a relatively comfortable position" (Engels, 1892/1953: 19). Also Lenin (1920/1963: 19), based on Engels' observations, spoke of a labour aristocracy consisting of "workers-turned-bourgeois", "who are quite philistine in their mode of life, in the size of their earnings and in their entire outlook". These workers were seen as "the real *agents of the bourgeoisie in the working-class* movement, the labour lieutenants of the capitalist class" (Lenin, 1920/1963: 19). Google workers in comparison to ICT manufacturers have much higher wages and

privileges. This means that they are less likely to resist. Engels describes this as typical of the labour aristocracy: "they are very nice people indeed nowadays to deal with, for any sensible capitalist in particular and for the whole capitalist class in general" (Engels, 1892/1953: 19).

Slavoj Žižek (2012) has inappropriately described the Occupy movement as a salaried bourgeoisie that consists of "privileged workers who have guaranteed jobs" and "driven by fear of losing their surplus wage" (Žižek, 2012: 12). What he was really describing in this passage were Google professionals, a labour aristocracy in comparison to those working for ICT manufacturers. Marx grounded the notion of the surplus wage: in the *Grundrisse*, he describes conditions of production in which there is a high demand for labour in one specific industry, so that certain workers gain "surplus wages" that represent a "small share of [...] surplus labour" (Marx, 1939/1973: 438). In the foreword, Martin Nicolaus outlines a primary insight. For Marx, it is "theoretically possible, quite apart from the question of the economic cycle, for one fraction of the working class (but not the whole) to receive, via the mechanisms of the distribution of profit among the different capitalists, "an extremely small share of' the surplus value produced by themselves in the form of 'surplus wages' (438)" (Marx, 1939/1973: 48). If the ICT industry is seen as a combined industry and its profits as combined profits, highly paid software engineers and other highly paid knowledge workers have a wage that is higher by a certain surplus in contrast to poorly paid ICT assemblers. This relative surplus wage comes however at a price: long working hours, high stress, a relative high turnover of labour, poor work-life balance, and the tendency to have no social life outside the company. Google's software engineers are a prototypical example of the knowledge labour aristocracy.

The term 'labour aristocracy' is meant in an objective rather than a subjective sense. The Google labour aristocracy has relative surplus wages in relation to ICT manufacturing workers. Whether this status results in bourgeois consciousness that is homologous to that of managers and owners must be determined empirically. Google and similar knowledge companies totalise their employees' labour time. They pay relatively high wages as incentives to exploit high volumes of unpaid labour time. The Google labour aristocracy shows the internal contradictions of the global working class. Dyer-Witheford and de Peuter (2009) have analysed such contradictions for the computer game industry. Its existence depends on the labour of game designers, developers, testers, players, gold farmers in China, coltan miners in Africa and e-waste pickers.

Marx (1867/1976) argued that the rate of exploitation of workers can be calculated as e = profits / wages (Chapters 9, 18). It does not follow from this circumstance that software engineers tend to have higher wages than ICT assemblers because they are less exploited. The rate of exploitation depends not just on the level of wages, but also on the level of profits.

Silicon Valley is the valley of dreams for the class that reaps high profits from the ICT industry precisely because it is the valley of death for ICT manufacturing workers and the valley of stress for the labour aristocracy in software engineering. Silicon Valley is shaped by a geography of inequality, death, stress and the destruction of human livelihood. This is the foundation of the capitalist ICT industry and its profits.

Digital Labour and Online Prosumption

Corporate social media (Facebook, YouTube, Twitter, Weibo, Blogspot, LinkedIn etc.) all use a business model that is based on targeted advertising that turns users' data (content, profiles, social networks and online behaviour) into a commodity. Commodities have producers who create them,

otherwise they cannot exist. So, if the commodity of internet platforms is user data, then the process of creating this data must be considered to be value-generating labour. Consequently, this type of internet usage is productive consumption or prosumption in the sense that it creates value and a commodity that is sold. Dallas Smythe's concept of the audience commodity has been revived and transformed into the concept of the internet prosumer commodity (Fuchs, 2012). Digital labour creates the internet prosumer commodity that is sold by internet platforms to advertising clients. They in return present targeted ads to users.

Digital labour on "social media" resembles housework because it has no wages, is mainly conducted during spare time, has no trade union representation, and is difficult to perceive as being labour. Like housework it involves the "externalization, or ex-territorialization of costs which otherwise would have to be covered by the capitalists" (Mies, 1986: 110). The term 'crowdsourcing' (Howe, 2009) expresses exactly an outsourcing process that helps capital to save on labour costs. Like housework, digital labour is "a source of unchecked, unlimited exploitation" (Mies, 1986: 16). Slaves are violently coerced with hands, whips, bullets—they are tortured, beaten or killed if they refuse to work. The violence exercised against them is primarily physical in nature. Houseworkers are also partly physically coerced in cases of domestic violence. In addition, they are coerced by feelings of love, commitment and responsibility that make them work for the family. The main coercion in patriarchal housework is conducted by affective feelings. In the case of the digital worker, coercion is mainly social in nature. Large platforms like Facebook have successfully monopolised the supply of certain services, such as online social networking, and have more than a billion users. This allows them to exercise a soft and almost invisible form of coercion through which users are chained to commercial platforms because all of their friends and important contacts are there and they do not want to lose these contacts. Consequently, they cannot simply leave these platforms.

In a passage in the *Grundrisse*, Marx (1939/1973: 462) makes clear the various components of alienation within capitalism. The worker is alienated from herself/himself because labour is controlled by capital, the material of labour, the object of labour and the product of labour. These four components of alienation can be related to a labour process that, in a Hegelian sense, consists of a subject, an object and a subject-object. We are talking here about alienation of the subject from itself (labour-power is put to use for and is controlled by capital), alienation from the object (the objects of labour and the instruments of labour) and from the subject-object (the products of labour).

All workers that are exploited by capital are alienated from the products of their work. In corporate social media, alienation takes on a specific form. Users are objectively alienated because in relation to subjectivity they are coerced by isolation and social disadvantage if they leave monopoly capital platforms (such as Facebook). In relation to the objects of labour, their human experiences come under the control of capital. In relation to the instruments of labour, the platforms are not owned by users, but by private companies that also commodify user data. In relation to the product of labour, monetary profit is individually controlled by the platform's owners. These four forms of alienation together constitute capital's exploitation of digital labour in corporate social media.

Congolese miners, Foxconn workers, Indian and Californian software engineers, call centre workers and social media prosumers are all alienated in the sense that they do not own the profits and products they produce. In the case of social media users, the situation is somehow different. They create two different use-values by the same digital work: communication and public visibility.

Advancement of these use-values raises the prospect that users will be confronted by targeted ads. We can therefore speak of the double character of use-values in corporate social media. On the one hand, users produce use-values for themselves and others, they create a social relation between users and public visibility. On the other hand, users produce use-values for capital (i.e. targeted advertising space for the advertising industry). The dual character of use-value makes the Facebook product a peculiar product. It serves users' own social needs and the commercial needs of advertisers. At the same time, the commercial use-value is first controlled by corporate platforms. They enable the exchange value character and commodification of user data. There is also a specific form of coercion that takes on a social form. Leaving a corporate platform is not so easy if one has many contacts there. There is always the threat of fewer contacts and communicative impoverishment.

In the world of digital labour, the fetish character of the commodity takes on an inverted form. We can speak of an inverse fetish character of the social media commodity. The commodity character of Facebook data is hidden behind the social use-value of Facebook (i.e. the social relations and functions enabled by platform use). The inverse fetish of Facebook is typically expressed in statements like 'Facebook does not exploit me because I benefit from it by connecting to other users'. The objective status of users, that they serve the profit interests of Facebook, is hidden behind the social networking enabled by Facebook. The impression that Facebook only benefits users socially is one-sided. The social benefits associated with the social relations and obtained visibility are at the heart of Facebook's exchange-value and commodity dimension. Exchange-value gets hidden in use-value; the object side of Facebook hides itself in social relations. The object side of Facebook is grounded in social relations between Facebook, advertising clients and users. The exchange relation between Facebook and advertisers is coupled with the advertising relation between advertisers and users. Both relations create profit for Facebook and their advertisers. These commercial relations do not immediately present themselves to the users, who mainly see the relationships between themselves and other users. Facebook takes advantage of its inverse fetish character by presenting itself as an organisation that is about sharing and social relations.

Conclusion

The IDDL shows that various forms of labour that are characteristic of various stages of capitalism and of capitalist and pre-capitalist modes of production interact. Thus, double-free wage labour, unpaid 'free' labour, casualised labour and slave labour form a global network of exploited labour forms that create value and profits for the variety of companies involved in the capitalist ICT industry. The IDDL shows that stages of capitalist development and historical modes of production (such as patriarchal housework, classical slavery, feudalism and capitalism in general) and modes of organisation of the productive forces (agriculture, industrialism and informationalism) are not simply successive stages of economic development, where one form substitutes an older one. Rather, they are all dialectically mediated. Capitalism has not destroyed the possibility of slavery. Slavery on the one hand exists in a new form as wage slavery, on the other hand the likelihood of classical and feudal forms of slavery remain. As the example of slavery in mining shows, these kinds of slavery directly benefit Western ICT companies.

The earliest form of private property was constituted in the patriarchal family. The patriarchal mode of production and housework continue to exist in the IDDL. This takes the form of casualised

labour among the 'free' online workers of Google, Facebook, YouTube, Twitter & Co. It is also evident in the highly controlled and exploited work of call centre agents and ICT manufacturers. Classical and feudal forms of slavery, in which workers are not double-free, but rather the property of slave owners who physically coerce and almost limitlessly exploit them, persist in the extraction of minerals that form the physical foundation of ICTs. Capitalism is based not only on capital accumulation, but also on double-free wage labour, which means that workers are compelled under the threat of dying of hunger to sell their labour power as a commodity to capitalists. Such workers are alienated from the process and the products of capitalist production. This installs wage labour as a specific form of labour exploitation. Double-free wage labour takes on several specific forms in the IDDL. First, there are wage workers who work under conditions that resemble the early stage of industrial capitalism. These are manufacturing and assemblage workers, who risk their health and lives at work. Their work is no fun at all. They are subject to high levels of control, workplace surveillance and standardised work. This shows that Taylorist and Fordist factory work persists under new conditions in the information society. Also, call centre agents are facing a kind of Taylorist work regime. In contrast to ICT manufacturing and assemblage, their labour is not primarily physical, but informational in nature. Their main activities are talking, affective convincing, typing, using phone systems and accessing databases. The IDDL also involves relatively new forms of wage labour that are forms of highly paid and highly stressful play work, as represented by the Google worker.

Digital labour has thus far mainly been employed as a term which characterises unpaid labour conducted by social media users (see the contributions in Scholz, 2013). We can conclude from the discussion in this article that social media prosumption is just one form of digital labour that is networked with, and connected to, other forms of digital labour. Together, all forms of digital labour constitute a global ecology of exploitation that enables the existence of digital media. It is time to broaden the meaning of the term digital labour to include all forms of paid and unpaid labour that are needed for the production, diffusion and use of digital media. Digital labour is relational in a twofold sense. It is a relation between labour and capital and relational within the global division of labour. This is shaped by articulated modes of production, forms of the organization of productive forces and by variations involving the dominant capitalist mode of production.

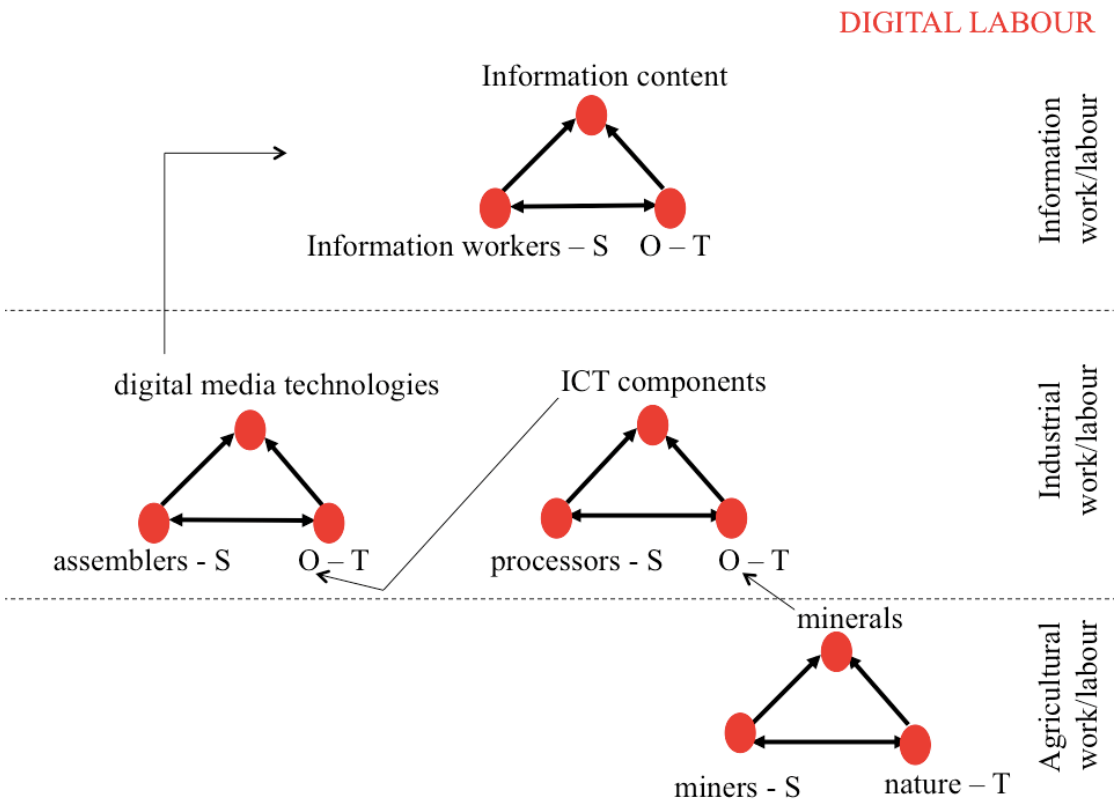

Figure 3. The complex network of cycles of digital labour

Figure 3 shows a model of the major production processes that are involved in digital labour. Each production step/labour process involves human subjects (S) using technologies/instruments of labour (T) on objects of labour (O) so that a product emerges. The very foundation of digital labour is the agricultural labour cycle, in which miners extract minerals. These minerals enter the next production process as objects such that processors based on physical labour create ICT components. These components enter the next labour cycle as objects; assemblage workers build digital media technologies and take ICT components as inputs. Processors and assemblers are industrial workers involved in digital production. Such labour produces digital media technologies that enter various forms of information work as tools for the production, distribution, circulation, prosumption and consumption of diverse types of information. 'Digital labour' is not a term that simply describes the production of digital content. I use the term in a more general sense for a whole mode of digital production that contains a network of agricultural, industrial and informational forms of work. Together, these forms of work enable the existence and usage of digital media. The subjects involved in the digital mode of production (S)—miners, processors, assemblers, information workers and related workers—stand in specific relations of production that are either class relations or non-class relations. So what I designate as S in Figure 3 is actually a relationship S_1–S_2 between different subjects or subject groups. In contemporary capitalist society, most of these digital relations of production tend to be shaped by wage labour, slave labour, unpaid labour, precarious labour, and freelance labour. People working under such class relations must emancipate themselves so that a communist mode of production can emerge that contains a communist mode of digital production alongside non-digital communist modes of production.

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