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COMMENT

Workers Reconstituting the Factory

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Abstract

This comment on Moritz Altenried's *The Digital Factory* discusses how the book offers four interrelated theoretical contributions to the study of labour in the digital economy – redefining the factory, specifying digital Taylorism, materializing its infrastructure, and mapping class relations – through four sites of investigation. The piece discusses the implications of the resulting multiplication of labour and labour relations for reconfigured class relations and resistance and argues that the differentiated social relations across spatial and material contexts ask for a theorization of the conjunctural nature of these relations.

Moritz Altenried's book *The Digital Factory* is an elegant synthesis of work on digital technology and how it reshapes capital accumulation, the labour market, and control of workers, adding new research on specific sites and uncovering the hidden labour at work to service and make concrete the very technology that is so often presumed to be automated or in the cloud. Altenried identifies the dual phenomena of homogenization and fragmentation of space and of labour through surveillance, monitoring, precarization, and multiplication, describing these changes. He examines four sites of these processes and focuses on outlining their diverse labour regimes: logistics, gaming, crowd work, and social media support. He conducted more than seven years of fieldwork, involving ethnography in warehouses, union meetings, and online as a crowdworker and gamer himself; interviews with a wide range of stakeholders, including workers, trade unionists, managers, and industry experts; and document analysis of contracts, lawsuits, and patents, for example. In each instance, he identifies how the digital technologies ramp up surveillance and monitoring, quantification, standardization, and task-fragmentation, and intensify forms of Taylorist control. These changes are particularly significant in how real-time surveillance enabled through digital processes exaggerates control. Important to his analysis are how they produce specific forms of integration and cooperation within different labour regimes through algorithmic management and outsourcing across global geographies.

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Altenried opens his book with Andrew Norman Wilson's video installation *Workers Leaving the Googleplex*,[1] which draws from Harun Farocki's, *Workers Leaving the Factory*,[2] itself referencing the classic by Louis Lumière, *Workers Leaving the Lumière Factory in Lyon*,[3] often noted as the first moving picture made. Farocki's film puts together scenes of workers leaving factories across time and place from American and European films, documentaries, and newsreels. The film works through the repetition of the image of production workers leaving work, in their masses, linking productivism to progress and the nation, as with Nazi film clips and the Detroit-area Ford factory, and conjoining the technical process of filmmaking with, forever after, the common scene of the factory. Wilson's Googleplex video inverts this symbolism to reference the hidden workforce of Google today, in this case the black and brown precarious workers wearing yellow badges, who are not the recognized categories of the campus workforce, who are monitored closely, and who come and go silently at different times of day than the other employees. They are there to scan books, and Wilson was fired for filming them. Wilson has another piece called ScanOps where he reproduces shots from those book scans in which ghostly thumbs and forefingers of workers smudge book pages and margins, attesting to the same absent presence of these workers.[4]

Altenried begins, then, with the concept of the factory, how it endures, and yet how it has changed with digital technologies. In retheorizing the factory in this comprehensive and accessible book, he insists on the centrality of labour within changes to capitalism. Altenried's argument about the factory is threefold. First, that it has not disappeared, nor has its "menial and routinized" labour;[5] instead there is a focus on the reorganization of work, in contrast to theories of capitalism that emphasize creative, immaterial, and cognitive labour. Second, and its corollary, while not always appearing to be factories, the *logics and techniques* of "the factory" abide, particularly through "digital Taylorism". Thus, he details the logics of surveillance, time-measurement, the decomposition of labour, and routinization of tasks in the organization of Amazon warehouses, last-mile delivery, "gold farming", and quality assurance in online game production, crowd-work servicing of AI programmes, rating work to support search engines, and endless content moderation for social media sites. Third, if we focus on the logics of the factory and not on the site of the factory per se, then these new configurations are uneven, displaced, overlapping, and spread out. They produce new geographies through digital technologies, with workers located in multiple places throughout the world, and including the use of various forms of migrant labour. These new logics of the factory, in turn, produce new modes of conflict and resistance. The digital factory multiplies labour,[6] but does not offer a new Fordist "mass worker" as political subject.

[1]Andrew Norman Wilson, *Workers Leaving the Googleplex*, video (2011).
[2]Harun Farocki, *Arbeiter verlassen die Fabrik*, video (1995).
[3]Louis Lumière, *La Sortie de l'Usine Lumière à Lyon*, video (1895).
[4]Andrew Norman Wilson, *ScanOps*, video (2012-ongoing).
[5]Moritz Altenried, *The Digital Factory: The Human Labor of Automation* (Chicago, 2022), p. 5.
[6]Sandro Mezzadra and Brett Neilson, *Border as Method, or, the Multiplication of Labor* (Durham, NC, 2013).

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In short, he writes, "digital capitalism is not characterized by the end of the factory, but by its explosion, multiplication, spatial reconfiguration, and technological mutation into the digital factory".[7] The book's first theoretical contribution thus is the concept of the factory, which Altenried sees, instead of as a place or a location for manufacture specifically, as a "system of organizing and governing the production process and living labour".[8] The factory is an "apparatus and logic for the ordering of labour, machinery and infrastructure across space and time".[9] The new economic activities and loci of capital accumulation, such as Amazon, Google, and Facebook, rely on human labour, which is invisibilized and yet controlled in ways that we as labour scholars certainly recognize. The second theoretical contribution of the book is its systematic theorization of a concept of digital Taylorism.

Third, Altenried materializes these digital technologies, including the physical infrastructures and the software systems. Digital technologies can be described through their infrastructures, the underwater cables, and the geopolitical relations required to facilitate them; the vast data centres located in specific places where weather, labour markets, and state encouragement beckon; the privatized devices of smart phones, computers, Internet, and electricity used by the hundreds of thousands of workers at home to do the tasks paid by low wage piece rates; the huge warehouses sited in outskirts of cities; and the physical assembly lines of distribution, including the independent contractor drivers and workers ensuring that the goods get to their consumers. Fourth, once we materialize the infrastructure and its concrete living labour, then, as he suggests, it points us to the "spatial composition of class" in these very reconfigurations.[10]

The body of the book examines these four interlinked contributions – redefining the factory, specifying digital Taylorism, materializing its infrastructure, and mapping class relations – through four sites of investigation. The chapter on logistics examines containerization and connects its logics of standardization and flow to digitalization and the algorithm. It presents the labour of warehouse workers in the Brieselang Amazon fulfilment centre in Germany and last-mile delivery drivers in UPS in the United States, as each task or delivery is parsed out through apps and controlled through surveillance of workers' every movement. In both locations of the chain, capital also relies on outsourced, seasonal, and gig labour. The chapter argues that the seamlessness of commodity distribution belies fragmentation and multiplication of labour.

The next chapter outlines the site of gaming and the labour required to operationalize it. In this fascinating focus, it examines World of Warcraft and the "Chinese gold farmers" working to play the game to collect virtual gold to sell on to consumers willing to pay to jump levels. It documents the repetitive and mundane work which tests, develops, and plays the games for others. Workers based across the world, but mostly in China, play the game online in order to win digital goods,

[7]Altenried, *The Digital Factory*, p. 6.
[8]*Ibid.*
[9]*Ibid.*
[10]Cited in Altenried, *The Digital Factory*, p. 10, from Alberto Toscano, "Factory, Territory, Metropolis, Empire", *Angelaki*, 9:2 (2004), pp. 197–216.

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which are exchanged for money to increase the status and position of those paying. The "gold farmers" sell their labour, often in large warehouse complexes set up for these gamers. Their jobs extend over long shifts, where they repeat sequences within the games. Not allowed officially, these workers are often virtually attacked in racist encounters with other players, who view the gold farmers as cheating in the game. While a shadow economy, this industry remains highly profitable, thereby spawning a global labour force inscribed as symbolic and racialized virtual migrants,[11] with work outsourced to low waged labour in developing economies to service the game production for consumers in the global North. A second focus of this chapter is those workers testing and conducting quality control of games to report errors to the software engineers. This is labour-intensive work, located in the global North, but less visible than the creative labour of developers. This workforce is often contracted or done by interns, who similarly spend long hours on repetitive discrete tasks. The site of gaming, then, produces overlapping but fragmented relations within complex digital labour processes.

The third site is that of crowd work through platforms accessed by people from around the world using home computers and cell phones. Crowd work breaks tasks down to individual mini-jobs, standardizes the work, and surveils workers over the platform through ratings and algorithmic management, all the while relying on self-management and invisibilized cooperation from workers across the platform. It fragments the labour market and integrates a new workforce of people often limited in working time by care responsibilities or simply no other employment opportunities in local labour markets. Much of the work itself serves to train AI in functions that still require human labour. While the labour process is broken down and people hired repetitively to complete individual tasks, it disperses workers around the world, dividing them from each other. They are not employees, of course, but independent contractors, using the platforms as a market to connect to those selling work. They are paid piece wages for each task, and the fragmentation also means that workers compete for tasks from across locations with different rates of pay.

The final site involves the services of social media and personal data collection. Altenried documents social media as material and labour infrastructures. The chapter discusses the huge server data centres, the energy systems required to run and cool them, and the underwater cables connecting them. Human labour builds and maintains this physical infrastructure. He links these sites to the labour to make the phones, computers, and parts for them. The content moderators are another group of workers labouring to enable social media infrastructures to operate. These contract workers evaluate images and posts for violence, offence, and pornography. Often, they are migrant workers. The decisions evaluating the content require human feedback of context, of language, and of meaning. Content moderators work on quotas, with algorithmic management monitoring their activity. They are subject to strict measures, which pressure workers, all while they engage with traumatizing content. From these four sites of everyday digital labour, Altenried shows the ways

[11]Altenried, *The Digital Factory*, p. 76.

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in which workers materialize infrastructures of digital capitalism, becoming subjected to factory discipline across divided landscapes.

As noted above, these are particularly relevant examples to concretely examine the digital factory. Throughout the book, Altenried uses artists' work to facilitate his descriptions. He assists the reader through a connection with visual representations in each chapter – this runs from Wilson's videography to Alan Sekula's *Fish Story*, tracking containers and ship work, to Ge Jin's documentary *Goldfarmers*, surfacing experiences of migrant Chinese game workers, to Nick Masterson's *Outsourcing Offshore* (in which he outsourced all the content to online crowdworkers), to the short film *The Moderators* by Ciaran Cassidy and Adrian Chen, showing a training session for new content moderator recruits in India.[12] The use of visual references to analyse work and labour offers a particularly compelling demonstration of the content and opens ways of teaching in productive new directions.

In my closing comments, I want to pursue the implications of the multiplication of labour for reconfigured class relations and resistance. Specifically, what happens to the political subject embedded in such analyses, that is, a political subject no longer aggregated under one roof and no longer coming together as the mass worker? In each of the sites of analysis, Altenried introduces possibilities of new organizing, including strikes in Amazon warehouses in the US and Europe, actions by place-based app workers such as delivery drivers, exposés of the conditions of content moderators, campaigns to protest the invisibility of digital labour, and experimentation with online forums for connecting platform workers. As labour is multiplied in various forms across sites and their contradictory relations, forms of struggle, too, become various.

Yet, there is a tension in Altenried's analysis between these located contradictions and an impulse to abstract. Thus, the figure of the migrant becomes a new political subject, which includes both actual migrants working in data centres, sometimes internal migrants (as in Shenzhen gold-farming factories) and other times precarious workers in northern centres doing crowd work from home, and virtual migrants like the Chinese gold farmers, who appear virtually as racialized figures within games, and content moderators negotiating normative values across cultures from multiple physical locations. This figure of the migrant, within circuits of virtual and partial migration, seems to bear a lot in political imaginaries. I wonder if it is not another impulse to find a universal political subject behind which to mobilize? While many struggles – including at Amazon warehouses and among delivery drivers – have indeed relied on the action and organizing of migrant workers, I am interested in the tension in Altenried's work between documenting the fragmentation and multitudinous social relations of new forms of labour in place and a kind of compulsion to seek out a new general political subject.

By way of extending this point, I am also interested in how the situated materialities of the infrastructures themselves offer a mode of analysis. Again, there is a tension between making a broad argument characterizing digital technologies as "the digital factory", as this eloquent book offers, and insisting on the differentiated social relations across the space under which this happens. In my mind, it begs a

[12]*Ibid.*, pp. 60–61, 73, 92–94, 149–151.

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theorization of "conjuncture", or how articulations of relations in space and time are to be understood.[13] While Altenried's argument clearly pushes against the smoothing of processes, I was thinking of how, for instance, in logistics in South Africa, where I have been doing interviews with warehouse workers, the labour process adheres to many of the same disciplinary apparatuses described in the book for warehouse workers elsewhere. Workers are directed by algorithmic management through the use of handheld scanners and software programmes, which regulate the throughput of goods through the warehouse and register workers' rates and performance. Labour brokers employ most workers, who are scheduled to work at short notice and can be penalized if they cannot come to work. Yet for the South African workers interviewed, they outline their grievances not in terms of new digital technological control, but through a longer history of racialized displacement and a (post-apartheid) anti-union employer attitude, not unlike many other non-digital local labour processes. In other words, the new digital technologies have been absorbed into a conjunctural labour regime, located in a time and place – South Africa, thirty years after democracy – in which labour rights are protected de jure but the collective worker loses their power in the social imaginary and in the labour market, in a context where the official unemployment rate is thirty-two per cent and the extended unemployment rate is nearly forty-two per cent. In South Africa, another complexity is a fairly recent anti-immigrant politics not only among South African workers, but also among unions. The challenge that Altenried's book poses for us as labour scholars is how to analyse the located relations of living labour in a way that connects these processes globally to the wider contradictions produced in such sites.

Finally, in thinking about these contradictions, the role of turbulence and the "glitch" may be useful.[14] Not only does the interruption of seamless, smooth circuits of distribution and communication belie the presumption of abstracted technological power, and sometimes offer direction for new worker mobilization, in identifying choke points for instance, glitches also force recognition of conjunctural materialities that are constitutive of globalized digital technological capacities. In South Africa, where technology operates within the constant presence of the glitch, most clearly in regularized electricity outages, not only do these forms of turbulence disrupt the hegemonic framing of desire for abstract technological modernity, but in many instances they become new terrains of disciplinary control. Both the presumed function and the real disfunction of digital infrastructures are put on workers to overcome. In thinking through ways of connecting the concrete relations and forms of struggle producing the digital factory, these located materialities must be seen to constitute the very infrastructures, with labour reproducing and articulating them as global processes.

[13]For a framing of recent work on conjunctural analysis and specifically Stuart Hall's theorization of conjuncture, see Gillian Hart, "Modalities of Conjunctural Analysis: 'Seeing the Present Differently' through Global Lenses", *Antipode*, 56:1 (2024), pp. 135–164.

[14]Charmaine Chua *et al.*, "Introduction: Turbulent Circulation: Building a Critical Engagement with Logistics", *Environment and Planning D: Society and Space*, 36:4 (2018), pp. 617–629; Lauren Berlant, "The Commons: Infrastructures for Troubling Times", *Environment and Planning D: Society and Space*, 34:3 (2016), pp. 393–419.

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The Digital Factory offers us the complex grounds to interrogate how new forms of digital capitalism are changing labour regimes, how they involve continuities and are interconnected, and yet also produce new contradictions of class, race, gender, space, and geopolitics. It critiques both optimistic and pessimistic post-work imaginaries as effected by new technologies. Altenried insists on the enduring significance of workers' labour in capital accumulation, which reproduces relations redefining the logics and techniques central to these new loci of factory discipline and disassembly. He poses urgent questions for collective resistance to counter the reification of technology and capital in order to recentre social relations and struggle.

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