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**RENDERING SUPPLY CHAINS
RESEARCH AND ITS
(DIS)CONTENTS: AN ANTI-
PAPER ON OPEN KNOWLEDGE
AND MAINTENANCE AS A
RESEARCH ETHOS**

Abstract

Supply chains are fundamental to contemporary forms of capitalist production and circulation, but rarely make themselves known unless they stop working. This ‘anti-paper’ documents the beginnings of a project grappling with the possibilities and limitations surrounding digital renderings of supply chains and related research online in a way that goes beyond the spectacle of breakage. It is an ‘anti-paper’ in that it documents process and learnings over findings, results, or other finalised outputs. Section one introduces the project and the wider context it was born from and into, while section two reviews the existing landscape of digital projects surrounding supply chains and our attempt to develop some heuristics for thinking through their underlying epistemological, informational, and design assumptions, and how approaches to digital supply chain renderings differ along these lines, with possibilities and constraints entailed by each. Section three documents the dilemmas faced so far in our own project, and section four concludes by reflecting on maintenance as a research ethos and its relevance to learning about supply chains.

Introduction: Learning how to learn about supply chains

2020 and 2021 have shown how integral supply chains are to the functioning of contemporary capitalism, and how much the transnational movement of goods shapes everyday life. Pandemic-driven disruption has revealed the fragility of the ‘just-enough and just-in-time’ model, seen in empty store shelves during widespread shortages, and the viral satellite images of the *Ever Given*, the infamous ship that got stuck in the Suez Canal in July 2020, rendering idle billions of dollars’ worth of “value-in-motion” capital (Stoller; “*Ever Given Ship That Blocked Suez Canal Sets Sail after Deal Signed*”; Harvey, “*Value in Motion*”). Reporting on these developments — both the supply chain crises reshaping global trade and the trade unions (re-)emerging to fight for worker protections across the industries that constitute them — have often fixated on their perceived novelty. But if the critical histories of plagues, wars, and crises by other names have taught us anything, it is that such events are always preceded by structural inconsistencies, usually entrenched in the economic interests of the powerful (Klein; Harvey, *A Brief History of Neoliberalism*).

Despite headline-grabbing news of disruption, and a growing public awareness of their everyday importance, supply chains continue to remain abstract and invisible to many, made visible only when they don’t seem to work. The visible-when-broken characteristic of supply chains carries an interesting corollary: once visible, they look or work nothing like the smooth lines of our logistical imaginaries. They are janky, patchy, heterogeneous — even the people working on managing them can’t quite

figure them out. As Anna Tsing suggests in *Supply Chains and the Human Condition*, the great imaginative challenge of global capitalism is capturing both its bigness and diversity (Tsing). Our logistical imaginaries — of globally standardised inventory codes and intermodal containers ensuring next-day delivery — are dominated by the former, and understandably give us, the consumers, an impression of smoothly scaled planetary control. And yet as Tsing reminds us, fully rationalised standards are as much an illusion as fully rationalised labour.

This has become particularly striking as various mainstream journals, magazines, podcasts and TV series attempt to untangle global supply chains. One example is what Bloomberg podcast host Joe Weisenthal discovered when — in an attempt to understand the trucking industry — he joined a truckers’ Whatsapp group and found a stream of haphazard requests for trucks at various locations around the United States (Weisenthal and Alloway). The financial journalist — whose typical podcast episodes span topics from cryptocurrency and treasury markets to decentralized finance and derivatives trading — found himself scratching his head over the patchy coordination of trucking and commodity circulation. Recounting his experience, Weisenthal called the logistics industry old-fashioned. What’s old-fashioned about the present? Spinning his comment on its head, might the problem not be that our discursive presents often live in an anticipated future where dreams of smooth automation overshadow the disjointed way things circulate around the world in the here and now?

Importantly, in the past two years supply chains and logistical sites have called attention to themselves not just through cogs of capital getting stuck *a la* *Ever Given*, but also through worker-led contestation against its relentless race-to-the-bottom expansionism.

Worker movements have targeted logistical giants, like the historic win of the Amazon Labor Union who unionised the first ever Amazon fulfilment centre at its JFK8 facility in Staten Island (Weise and Scheiber). They have targeted strategic chokepoints like the recent announcement of a strike at the port of Felixstowe, the UK's busiest container terminal (Jolly). The mining underbelly of our battery-powered green futures has gained visibility through popular contestation of and protest against lithium mining projects in places like Serbia, the sacred indigenous lands at Thacker Pass, the North-Western Iberian Peninsula, and Chile's Atacama desert, which all refuse the smokescreen of green capitalism (Riofrancos).

Supply chains and digital ways of knowing: Introducing the re:source project

In the spring of 2020, an online reading group about the social life of supply chains brought us together in collaboration, from which the re:source project emerged. Our collaborative research is driven by the three-fold observations outlined above: that discussions around supply chains tend to surface mostly around spectacle-driven events; that once they surface they turn out to work nothing like dominant imaginaries of smooth circulation; and that worker-led contestations and organising efforts to counter the inhumane conditions of supply chain capitalism operate beyond the ebb and flow of Ever Given capital spectacles and occupy an increasingly important strategic and visual place in the digital realm. To each of these we formulated a corresponding question that drives our research: (how) can supply chains be digitally rendered in a way that isn't spectacle-driven? How can digital design accommodate scale without

abandoning heterogeneity? How far can public interest technologies go in supporting or being in solidarity with worker organising for improved material conditions?

While our work is mostly done outside institutional support structures, during the summer of 2021, we received mentorship support from the Wikimedia Deutschland Foundation to prototype a public-facing technology about this ecosystem of supply chains research. We joined this program with a desire to develop a project that drew on an open-source ethos, particularly the counter-corporate modalities of the free and open source software movement and the open knowledge movement that followed, believing it might equip our collective with the tools to visualise supply chains and related research not at the point of breakage, but rather as on-going and all-encompassing processes.

Many tensions emerged from this work: between rendering the complexity of supply chains in their multiplicity as opposed to partial entry points which might be more easily navigated, between the delineations of what open and closed renderings might mean in different contexts, and ultimately between the perceived novelty of our research itself alongside the practices and projects of those whose work we were building upon. Our project has oscillated between content and form: what do we render, but more crucially — how do we render?

In contrast to the epistemic rigidity of asking "what is a supply chain" from the perspective of one particular field, we have asked how rendering supply chains research invites acts of translation across disciplines and ways of knowing. Rendering this research required abandoning the logics of totality and instrumentality in favour of developing heuristic techniques that have shifted the question from 'what is a supply chain' or 'what is the supply chain of x' to

‘how can we learn how to learn’ about supply chains and ‘what renderings enable their visibility’ — particularly the visibility of workers who enable supply chains to ‘work’ in the first place.

Structuring an (anti)-paper

Ultimately, we found that supply chains research and its rendering required abandoning the logic of novelty itself — so relevant to the academic project, to understand the connections between already-existing lifeworlds and research that had been conducted long before we entered this space, especially if it was meant to support the workers within supply chains themselves. This notion of maintenance as our research ethos, long discussed within feminist literature, has become a core tenet of our collaboration. This piece retraces the contours of our experience, and reflexively documents the logics of our own progression in this ongoing project towards this ethos. As such, what follows is perhaps best thought of as an anti-paper, centering process over output, obstacles over solutions, hesitation over conviction, as materials and affects that deserve their own attention rather than being editorially discarded.

Open knowledge as an entry point for supply chains research

The groundwork of the project itself was based in a kind of assemblage and (re)assembling of fragmentation, first housed on are.na, a website for link saving, curation, and “(re-)contextualisation of information” according to its founders (Broskoski 2). We collected and shared links with each other

through are.na channels,[1] focusing on a combination of ongoing scholarly work, as well as investigative pieces about various “breakages” in a variety of contexts: from the Beirut port explosion in 2020 to ongoing coverage of supply chain disruption, protests or other moments of “breakages” — as well as when they have been deemed to be working (at least by some). In the early days, we constantly discussed how we might transcend the perceived limitations inherent to such “instance”-based reporting, and wondered if it were possible to trace moments in their entirety, with or without technological methods.

We eventually found a supported place of experimentation through the Wikimedia Unlock Accelerator, a three-month program for civic-minded technologists and others: involving mentorship, condensed periods of working, and interactive workshops not unlike the modern “hackathon” (Zukin and Papadantonakis). It was here that we learned about best practices for developing technology with a civic orientation: from user-centred design to licensing schemes, to developing crowdsourcing models, fundraising and project sustainability, as well as conducting user testing. We had applied because a Wikimedia mentorship program would throw us directly into the modern open knowledge movement, where we saw promise for unpacking, if not answering some of our pressing questions driving our collective research.

Finding our foundations in the open knowledge movement

The “open knowledge movement” as it was known in the 2000s emerged from the coat-tails of the free software movement of the 1980s. These early advocates of the “free” part of “free and open source” software were

hackers, able to adjust the pre-programmed settings on computers. In many ways, they acted as critics of liberalism from within liberal states, employing notions of “productive freedom” to “reformulate key liberal ideals such as access, free speech, transparency, equal opportunity, publicity, and meritocracy” while sharing software amongst themselves (Coleman 3). As the software field began to commercialise in the 1990s, the “open” software advocates split from the “free” software movement — creating legal and technical mechanisms that were more friendly for institutional and corporate reuse.

This schism between “free” and “open” exists within software to this day, and the “open knowledge movement” finds its roots in both factions. Calls for “open knowledge”, or rather the opening of knowledge-producing practices emerged in the early 2000s, first associated with calls for open access publishing in a time of increasing consolidation for the academic publishing industry. It eventually extended to mass-crowdsourcing projects like Wikipedia, and to “open data” initiatives across governments, corporations and everything in between. These seemed to prove that this move towards open knowledge in multiple fields and on multiple fronts has been a resounding success.

At the same time, the increasing crackdown on whistle-blowers across industries demonstrates how the move towards “openness” has far from eradicated the practice of institutional secrecy and malpractice (Ballesteros; Hetherington; “The Age of the Whistleblower”). Indeed, the information landscape related to supply chains often appears to operate in two streams: between that which is voluntarily given by institutional actors of all kinds, particularly that which is volunteered due to institutional requirements like Corporate Social Responsibility (CSR), or Environmental, Social, Governance (ESG) reporting, and that which is retrieved

by journalists and activists — usually in the form of investigative journalism.

From open knowledge to information landscape

The open knowledge movement proved to be a space of both incubation and interrogation for our project, begging questions like: are these two streams within the information landscape fundamentally incompatible, both a kind of ‘open’ or ‘opening’ knowledge? What knowledge is being produced surrounding supply chains more broadly, and for whom is it for? Who uses it? Who is it ‘useful’ for? Can an open knowledge or open source project about supply chains alter the material conditions of workers themselves? We found that these same tensions within the foundations of the ‘open knowledge’ movement itself, from both its critics as well as its advocates — but first, we needed to understand, or at least be aware of the full landscape of such renderings.

Existing digital renderings of supply chain capitalism

The extractive processes underpinning the various stages of a supply chain have long been documented in science and technology studies (Cooper), media studies (Hockenberry et al.; Rossiter; Pham), critical/marxist geography (Harvey, “Between Space and Time”; Danyluk), political science (Riofrancos; Daggett) and anthropology (Tsing et al; Crawford; Posner).[2] Similarly, the shipping and logistics industry has long been investigated for its implications in global networks of power (Cowen; Chua et al.; Khalili). As interdisciplinary graduate

students somewhere between the social sciences and the humanities, we stand on the shoulders of these giants.

However, we have been particularly interested in how supply chains are rendered outside of or beyond the written page, and what possibilities digital space offers for engaging with its networked form. As our focus became about something more narrow and applied, so did our questions: asking how supply chains currently exist in digital space, how to render them in such space, how to attend to concerns of scale and heterogeneity when beholden by the structures and limitations of digital design, and how to think about the emancipatory promise of digitally-centred activism, and the discourse that surrounds such work.

In this section, we retrace our review of existing projects — across research, artistic practice, advocacy, and online activism — that fall under this narrower scope. We then outline a heuristic we developed for thinking through the epistemological, informational, and design assumptions of the projects and what that says about who can contribute, with what kind of information, to what end.

Mapping the possibilities of the digital page

As we mentioned at the beginning of this paper, the earliest stage of our collaboration was a simple practice of gathering existing resources or projects that in one way or another spoke to our interest in supply chains. In addition to more traditional forms of scholarship, we found a number of projects that aimed to draw on the possibilities of the webpage as both a canvas and interface to engage with the networked nature of supply chains.

Mapping this landscape soon become a kind of counter-mapping process (as in, counter to existing mapping exercises that often focused on a single type of resource, or a single type of rendering). However, rather than map the landscape of academic research that addressed topics related to supply chains, we aimed to map their renderings: the landscape of digital projects that visualised them in digital space — albeit in different ways.

Figure 1: Gathering the landscape of digital supply chain renderings on Figma.

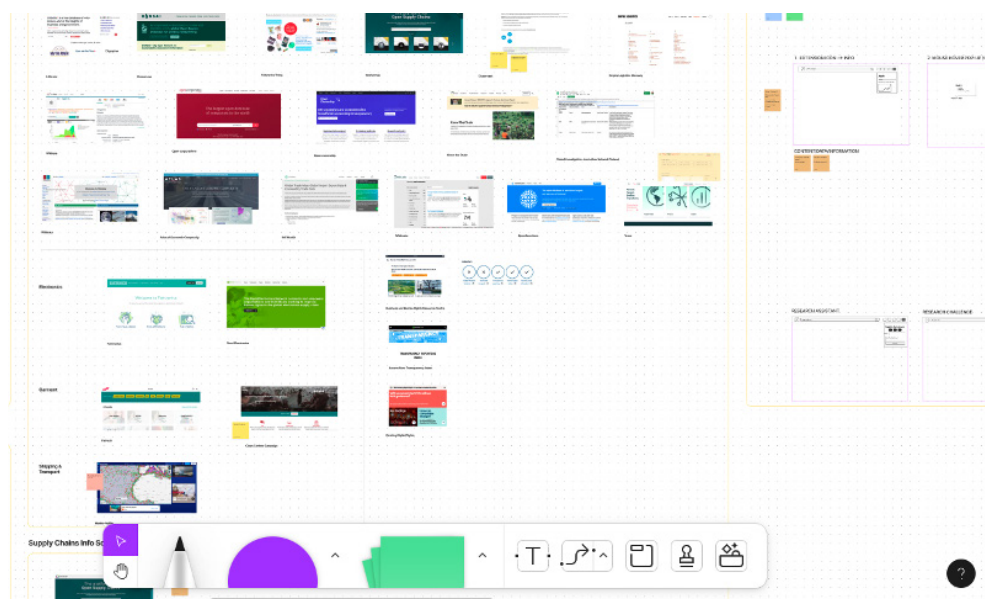
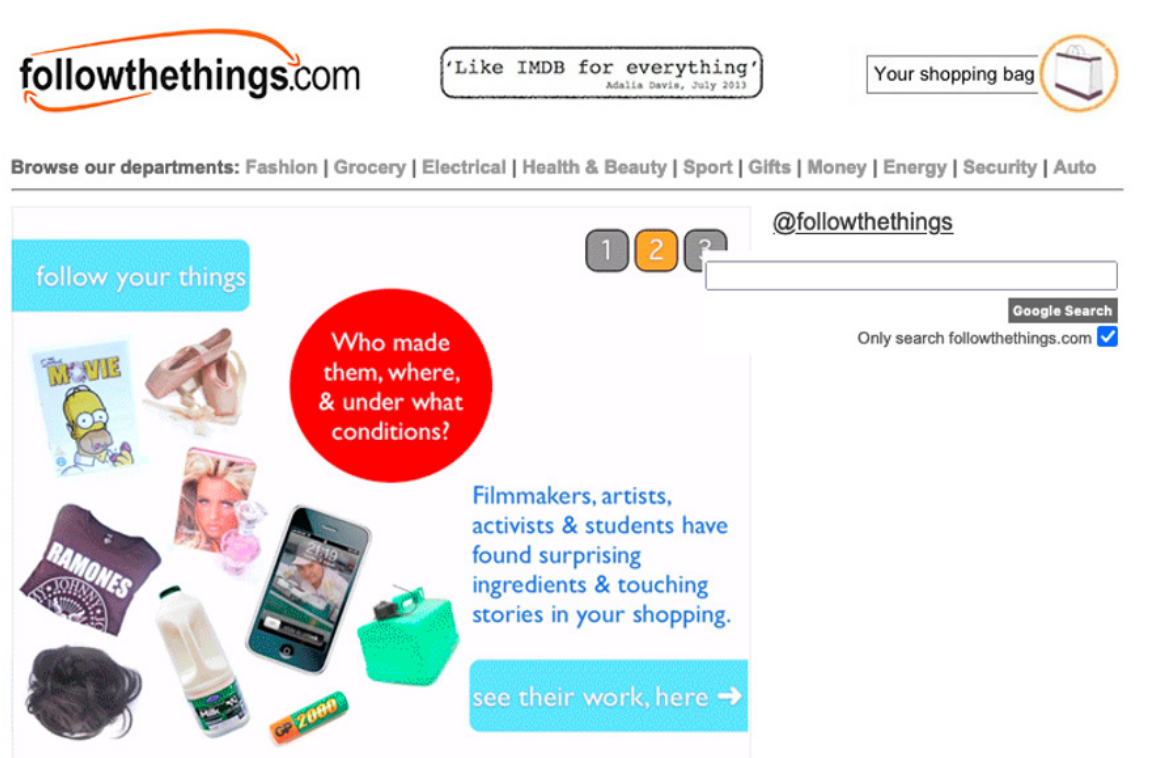


Figure 2: Simulation, familiarity, particularity: follow-the-things gathers documentation of the supply chain underbellies of various commodities that users can browse as if shopping online.



In our search, we found projects like *followthethings.com*, an Amazon underbelly of sorts, designed to match the feel of on-line shopping but linking the visitor instead to scholarship, films, stories, reporting on a given product.

Feral Atlas is an interactive multimedia atlas that allows users to explore “the ecological worlds created when nonhuman entities become tangled up with human infrastructure projects” (Tsing et al.).

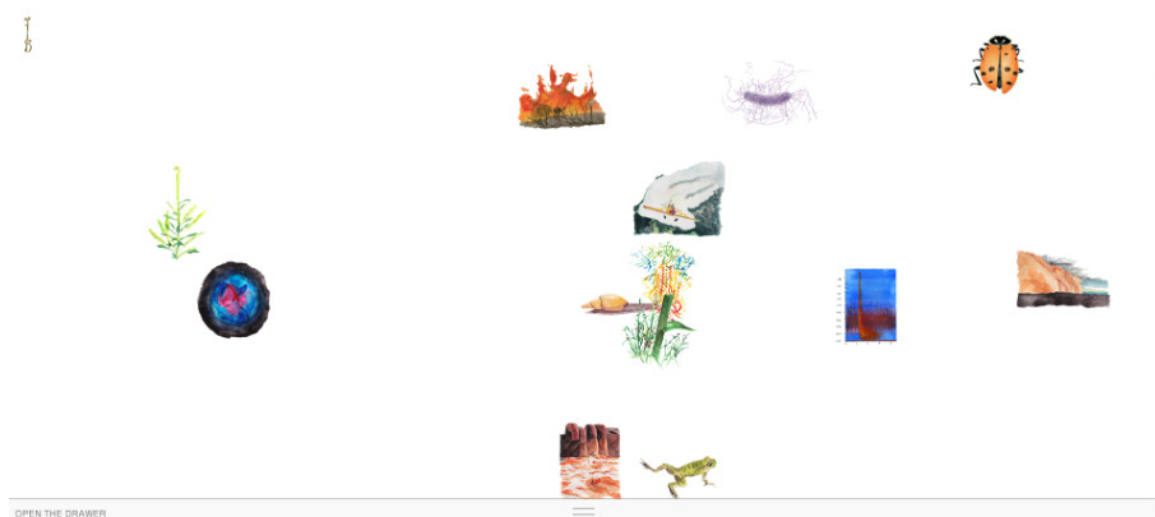
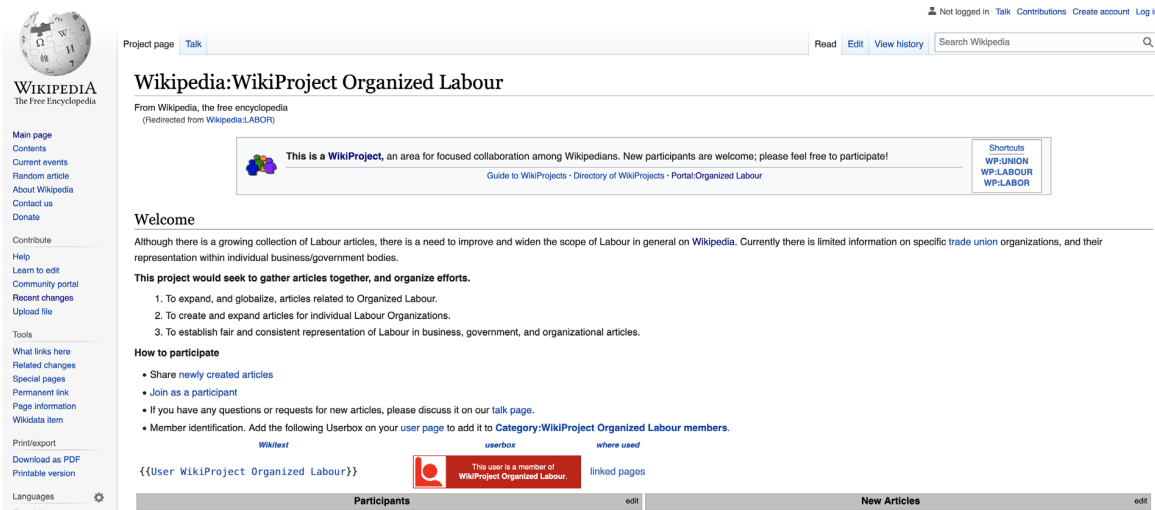


Figure 3: Unexpected connections: Feral Atlas is an online exploration of the political ecologies of commodity circulation and the more-than-human worlds entangled in supply chain capitalism.

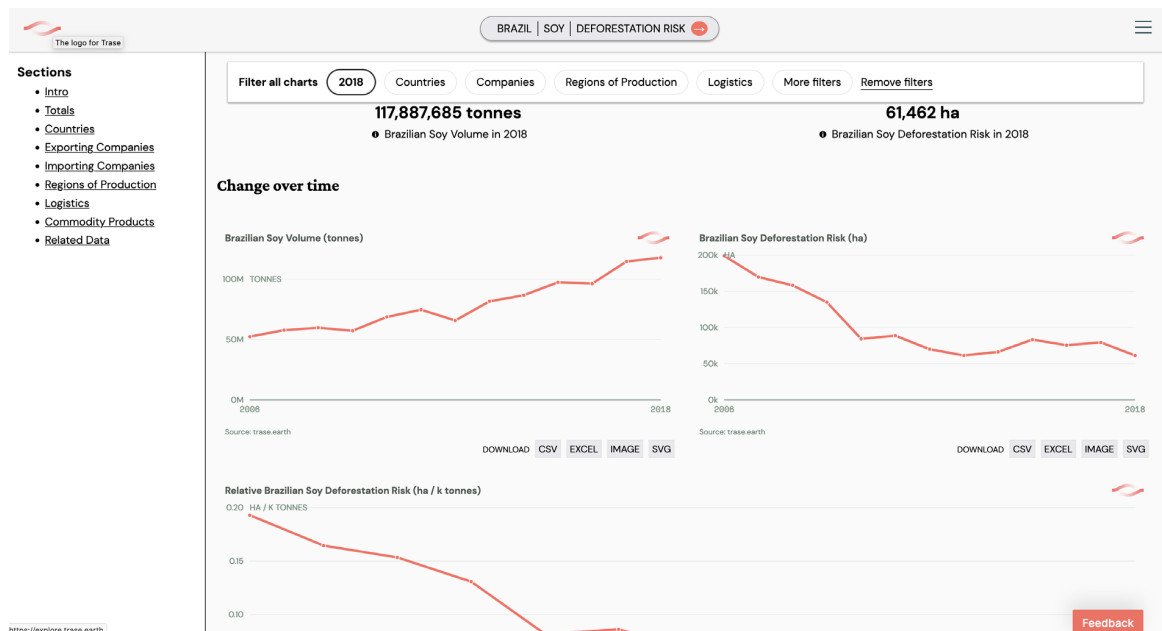
Figure 4: Welcome page of Wikipedia’s editing project dedicated to increasing online encyclopaedic coverage of organised labour.



Wikipedia’s WikiProject for Organised Labor aims to organise the efforts of Wikipedia editors (called Wikipedians) to improve the quality and quantity of articles on Wikipedia related to labor movements and labor organisations.

In engaging with digital possibilities of supply chain renderings, we didn’t want to limit ourselves to the scholarly-artistic realm or classical open knowledge projects, but rather consider it together with (or against the grain of) corporate representations of supply chains and their material flows. One example of this is *trase.earth*, a “data-driven transparency initiative” that attempts to map as comprehensively as possible the supply chains linked to deforestation (such as beef, soy, and palm oil).

Figure 5: Tracing every step: trase.earth is a data-driven project that seeks to make supply chains knowable online by breaking down their linkages in a quantifiable way.



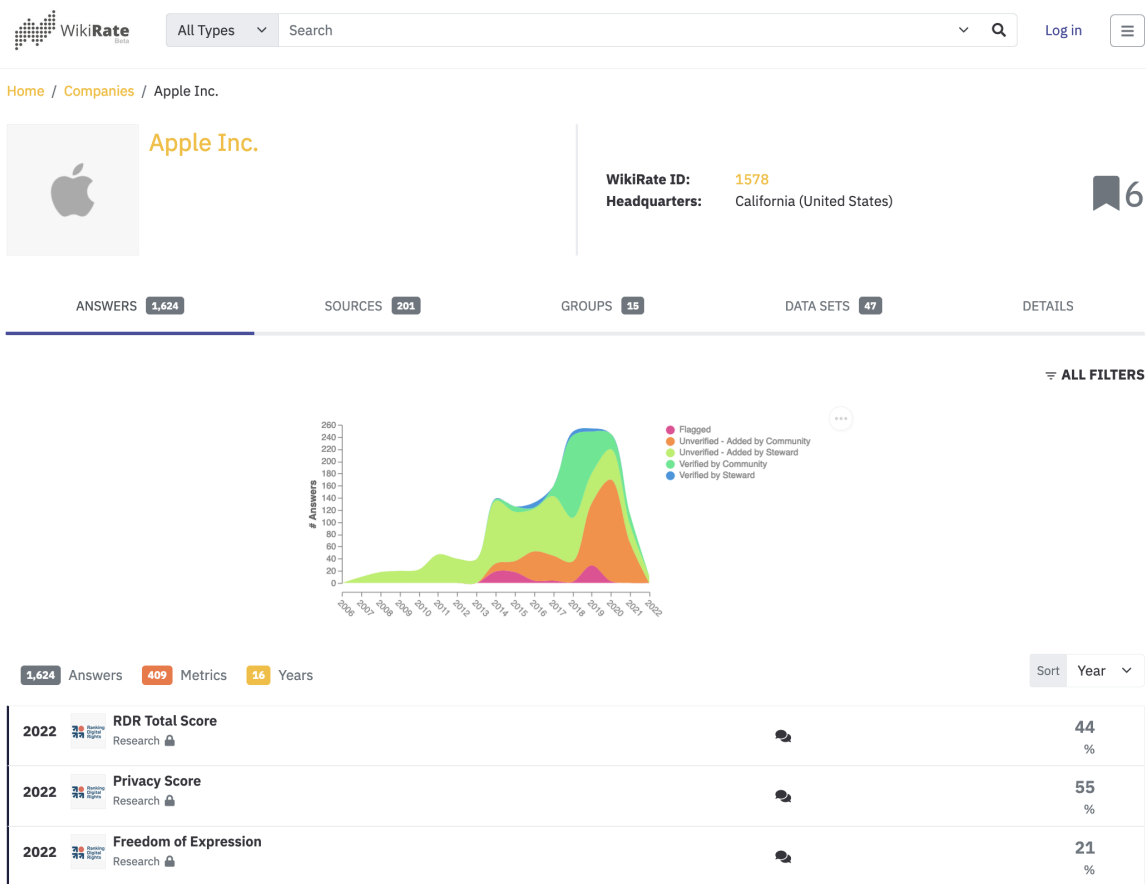


Figure 6: Point by point: WikiRate is a crowdsourcing platform for collecting data relating to companies' ESG compliance across their supply chains.

Along similar veins, we learned about Wikirate, which aimed to connect across these data-driven resources and reporting mechanisms: particularly those encased within CSR reports and other data-driven reporting mechanisms. These renderings are part of a wider emergence of a transparency paradigm in supply chain capitalism, whereby companies are urged to be more transparent about their corporate practices at a transnational level. This paradigm demands great critical appraisal, because rather than rupture corporate secrecy, what marks a continuity in this shift from secrecy to transparency is the corporate setting in terms of both the nature and pace of the information being released.

As Matthew Hockenberry argues, the corporate move toward and embrace of openness, the totalization of transparency,

has a dark undercurrent: “if everything was seen to be available, then no one would ever want to look at it” (Hockenberry). His ensuing project aims to embrace this ethos in their development of a mapping tool, called Manifest.

Interrogating the digital page: epistemological, informational, design assumptions

As we gathered existing projects, our questions shifted from “what can we learn from this?” to “how are we learning from this?”, and we began to think more about the epistemological, informational, and design assumptions embedded within each project or initiative. We became interested in questions

like: What kind of knowledge is deemed valuable? What kind of information does the project's design enable, invite, or close off? What relationship does the project establish with the user?

Based on these questions, we developed a heuristic that revolves around:

a) open and closed data/epistemes: what data/information/knowledge is allowed and what ways of knowing does this welcome/enable/encourage but also exclude?

This first dimension posits a spectrum of openness in the kinds of data, information, and knowledge that a certain project makes space for in its design. This ranges from the most epistemically closed-off projects, which have tended to be projects that draw on corporate or CSR data as their exclusive source for rendering *the* supply chain, to projects like *Feral Atlas* that embrace a much wider diversity of knowledge types and sources necessary for apprehending logistical worlds. For example, how might listening as a practice attune us to the infrastructural effects of the anthropocene, and how can this be incorporated into a knowledge resource about supply chains?

b) open and closed practices: with what degree of openness (for contribution and collaboration) does the project engage its visitor/user?

The second axis along which we considered the different projects we were coming across was the question of the practices and contributions it allowed from a user's perspective: can the user be a co-producer of knowledge or only its recipient? This helped us think through which projects see a potential for incorporating crowdsourcing and co-production into their project

designs, and which projects are more closed off in this respect.

From information mapping to heuristic matrix

Putting the two together, a matrix emerged that enabled the heuristic (but certainly non-exhaustive) categorisation of the projects we'd reviewed, which we've tentatively termed the "research ethos" of the different digital supply chain renderings. Cross-referencing the two axes schematises the different approaches taken by the projects. Some projects embrace epistemic diversity, but are closed by way of being presented as finished. Others are open in the sense of allowing on-going crowdsourcing contributions, but epistemically closed in their setting of parameters for what information counts as a valuable contribution.

For example, this means that indices and rankings designed for accountability purposes rely on reconstructions of information provided by corporations in the first place. In this sense, again the move toward 'openness' far from eradicates the practice of secrecy. On the contrary, such voluntarily released information makes the critical appraisal and countering of it all the more urgent, if not a kind of "corporate oxymoron" (Benson and Kirsch). The 2x2 matrix also helped us sketch a gap in the kind of project that might not have been attempted yet - one that manages to be open both in terms of epistemic diversity and in terms of user contribution and co-production.

Figure 7: Manifest: a mapping platform for documenting supply chains that takes into account the inherent incompleteness of any such attempt.

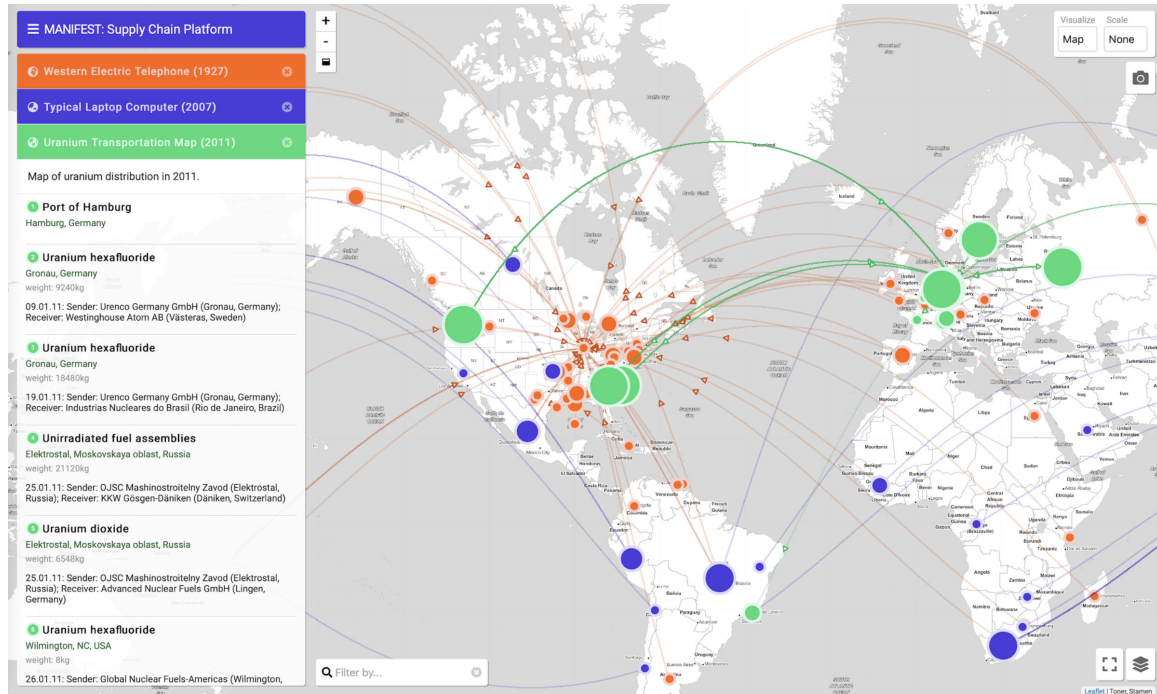


Figure 8: Underlying ethos: Sketching a heuristic schema for thinking through the epistemological and design assumptions of digital supply chain projects.

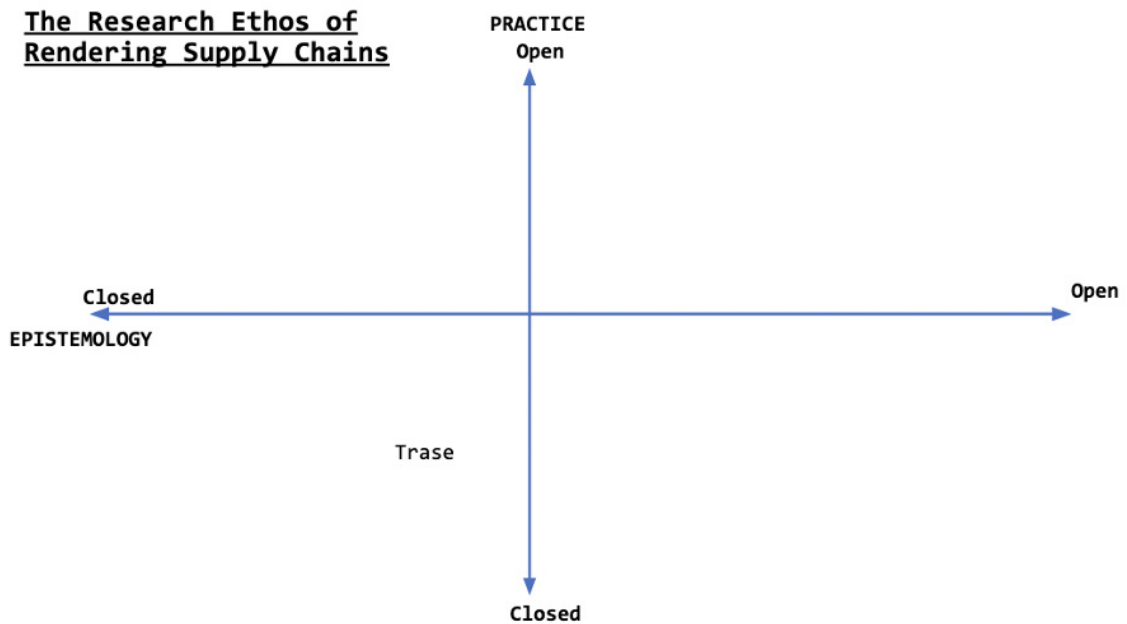
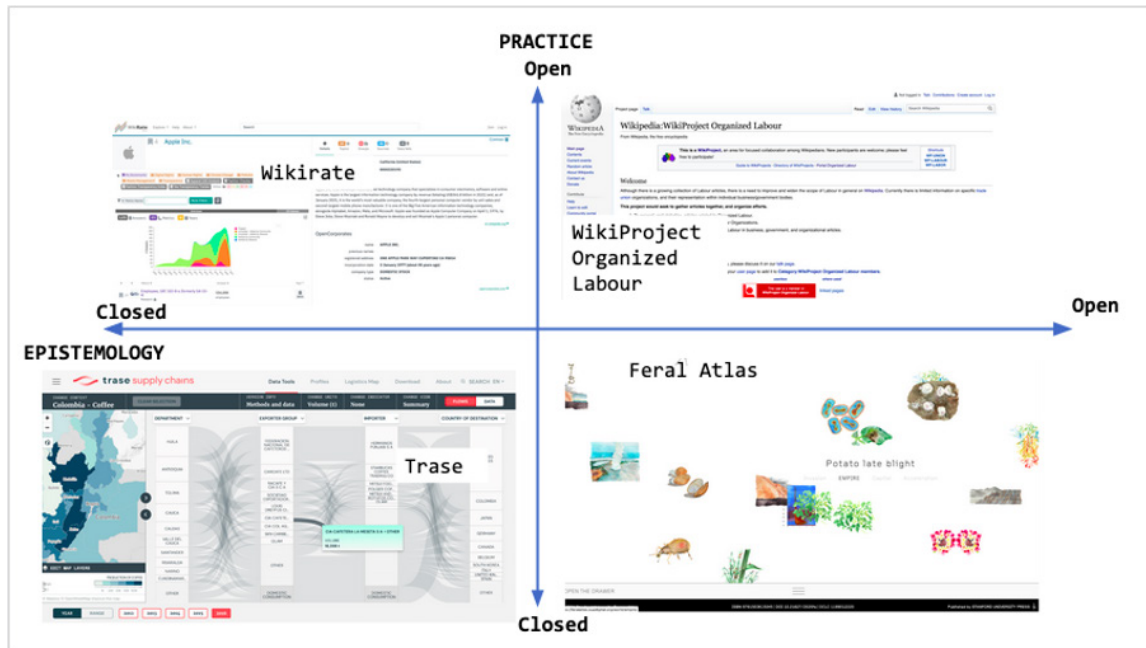


Figure 9: Examples of how existing projects might fit under heuristic schema.



Renderings for explorative learning

<i>Closed Practices</i>	<i>Open Epistemology</i>	<i>Examples</i>
Bespoke development for purpose of project	Pushing theoretical boundaries of existing renderings	Digital art-data projects: Feral Atlas, Solar Protocol, Anatomy of AI

Data-driven projects

<i>Closed Practices</i>	<i>Closed Epistemology</i>	<i>Examples</i>
Bespoke development for purpose of project	Uses pre-established understandings of data use, categorisations, schemas	Customised data platforms: <u>Trase</u> , Data journalism articles

Collecting open data for multi-purposes

<i>Open Practices</i>	<i>Closed Epistemology</i>	<i>Examples</i>
Crowdsourcing, content accessible to wider public, editable by public	Uses pre-established understandings of data use, categorisations, schemas	Open data platforms: Open Apparel Registry, <u>Wikirate</u>

Open knowledge for public documentation

<i>Open Practices</i>	<i>Open Epistemology</i>	<i>Examples</i>
Crowdsourcing, accessible to wider public, no account needed	Developing taxonomies with/by community practices	Open knowledge platforms: Wikipedia, OpenStreetMap, <u>Wikidata</u>

Process and obstacles, data dilemmas

It is important to specify that the heuristic tool we developed above was not meant to categorise the projects according to some external value judgement, but rather became part of our own process in figuring out, inductively and by way of thinking through what already exists, the kinds of trade-offs we would be likely to face in designing a digital tool or public technology for learning and thinking about supply chains. In designing digital tools that can help us learn how to learn about supply chains, how do we address the question of data? The amount of data available about supply chains is at once enormous but always partial, and from data systems that are not interoperable. The emphasis on quantitative data and numeric reporting often leaves out the partiality of workers' stories in more casual but increasingly strategic venues like Twitter or TikTok. The trade-offs that we saw emerging for thinking about our own project design can be summarised as the following:

- a. Standardisation:** Should the comparison across entities that data enables — and the standardisation it often entails — take precedence over heterogeneity, an important characteristic that renderings of supply chains often seek to present as seamless? With this in mind, should rendering the recognisable company as a unit of analysis (Apple, Amazon, etc.) take precedence over making visible the vector of production and circulation (subcontractors, transportation logistics) that they control?
- b. Scalability:** Rendering supply chains raises the challenge of

demonstrating their planetary scale without resorting to abstraction and erasure of difference. Many web-based informational projects build upon pre-defined information architectures and taxonomies that set the website on a certain path which may be difficult to change later on. If we take Tsing's definition of scalability as "[The] ability to make projects expand without changing their framing assumptions" (Tsing, "Supply Chains" 38), then the follow-up question must be: what is sacrificed at the expense of pre-determining parameters that make a web project scalable? How can we design in a way that allows framing assumptions to be altered as our own learning changes?

c. Completeness vs Partiality:

Finally, how can we insist on the value of patchy, partial, and non-comprehensive information — perhaps in opposition to the existing standards of "missing", "low-quality", or "low-accuracy" data? Can the development of digital tools be designed to decrease reliance on standardised and quantified information, and instead make space for the partial, temporary, incomplete, patchy, and heterogenous?

Discussion: Toward maintenance as research ethos

Across the informational landscape of how supply chains are rendered, projects operate with different levels of epistemological and informational openness and mobilise different vocabularies. This can make it difficult to

stitch together meaning from them, to such an extent that we often wondered if translating between them was still possible, or if they were inherently incompatible.

Throughout the Wikimedia Programme, we conducted interviews with a variety of actors that worked within or on supply chains: from global union activists, to investigative journalists, to researchers, developers and others. These conversations suggested that the politics of data surrounding supply chains wasn't as black and white as we had thought. The information used to both keep track of supply chains as well as the actors involved seemed to have lives of its own: used within both green-washing meetings as well as grassroots advocacy spaces. Bringing together siloed and disparate sources of information could itself constitute a contribution to the space and its own place of learning. Mapping the information landscape of supply chains research demonstrated how these projects could be connected with (or conversely, siloed from) each other, and to connect them might address these questions of standardisation, scalability, and completeness — if not, provide a space to simply address (and embrace) their respective partiality.

Equipped with this landscape, we have realised that our place within it should perhaps be not a novel contribution — a “gap” to be filled, a “niche” to be carved out — but rather a way of translating between existing ways of rendering, and the lifeworlds they imbibe. By working with what already exists, we see new relations of responsibility, reciprocity, and solidarity arising from the notion of ‘maintenance’ as opposed to ‘creation’ of knowledge. (Data) maintenance becomes a way of rendering research without pressure of novelty and competition, instead imbued with notions of care and collaboration at its core.

Academic Publishing and Maintenance Work

As a value, a practice, or ‘ethos’, maintenance bears an ambiguous relationship to academic research. On the one hand, maintenance is absolutely necessary to the research process (be it through access to libraries, archives, datasets, or other information repositories and infrastructures). On the other hand, it is invisibilized at best and shunned at worst at the stage of rendering research and presenting outcomes. This relationship becomes especially thorny with respect to the ultimate ‘form’ seen to legitimate academic research: the peer-reviewed journal article. In their current form, the incentives created by publishing and funding structures — arguably the two central pillars sustaining the academy as we know it today — do not align with practices of maintenance, and are stacked in favour of continuously pursuing that which is presented as novel. Academic progress and career success become intertwined with publishing records, which in turn all revolve around a novelty criterion, the knowledge gap, at the expense of cultivating the art of maintenance as a research ethos. Ironically, the very structures that maintain the legitimacy of this publishing system — peer review — are taken for granted and unremunerated as part of trying to make it through the increasingly precarious academic system.

As with all relations of power, this tension between novelty and maintenance transcends the academy, linking to broader gendered and racialised divisions of social life. Indeed, both gender and geographical representation in free and open source communities remain contentious issues. Research has shown bias in the process of collaborating with diverse actors, for example instances of prejudice when gendered

behavior (particularly female-associated) is displayed, as well as analyses of how notions of meritocracy bely demographic inequalities (Vasilescu et al.). Similarly, contributions to Wikipedia have been analysed for the inherent inequalities that enable volunteer behavior in certain communities, and necessitate remunerated work in others — particularly with respect to caring responsibilities (Reagle and Rhue 21). In other words, some people just don't have the time, money, and resources to contribute freely to a project like Wikipedia. More bluntly: does "free" simply mean sexist? (Reagle).

Indeed, notions of the "digital housewife" have emerged as a way of describing the "menial work" of digital life ring oddly true to the unpaid work of data production and verification that is so integral to the Wikipedia project, which we were inspired by through our own work (Jarett 2016). That is not to discount its importance, but rather the way in which work in free and open source projects may be shifting, and thereby perceived. As F/OSS has become institutionalised as a technological standard, its pioneering practices increasingly require the menial — and thereby less glamorous — work of maintenance (Jarett 2016).

Rendering and maintaining research through the re:source project

Can preservation itself be thought of as a form of 'value creation', separate from but integral to the pursuit of novelty? In the digital sphere, open knowledge communities, which operate peripherally to formal knowledge production (all while playing a crucial role in disseminating the latter), arguably have a much more intuitive relationship to and sensibility for maintenance as research ethos.

In contrast to academia, here, knowledge is built through small contributions with little recognition (at least in the public eye) that cannot necessarily serve as an instrument for personal or professional advancement. Wikipedia is perhaps the ultimate example of this information infrastructure. Used daily by millions who treat it more as a one-way system of information access, a quick click through the "View history" tab in the top right corner of any Wikipedia entry reveals it as the living, constantly (and often contentiously) evolving global informational ecosystem that it is.

Ultimately, we hope to develop and maintain an online project — a supply chain wiki of sorts — that can work against a culture of acceleration, of innovation for innovation's sake, of move fast, break things, in a moment when the public-political imagination is in need of a capacity to apprehend slowly and simultaneously unfolding crises. We want to put forward the idea that from the point of view of the participating individual, a data maintenance project is not just something to contribute to, but has a lot to give in return in terms of the kind of attention horizon it helps us cultivate, a different way of processing, absorbing, engaging with information and passing events that don't fit with the ebb and flow of news events as the dominant mode of information consumption.

Online maintenance work invites us to slow down and resist the instinct to jump to the next thing at the first opportunity. Maintenance as a research ethos works against the grain of knowledge, media, and social media industries increasingly invested in pushing us in the opposite direction: always privileging novelty, churning out news cycles at ever higher rates, fragmenting our attention spans. Participating in online maintenance/mapping/data collection projects cultivate a longer attention span which can overcome the temporal punctuation and

tempo with which news cycles dictate when things are happening, when things are being disrupted, when a crisis is no longer worthy of attention. To maintain is to sustain, support, and care for others: an ethos that is all-the-more important to cultivate in an age of relentless and ever-flowing capital, within the academy and across our supply chains (and their renderings).

Notes

[1] See: <https://www.are.na/miriam-matthiessen/logistics-research> and <https://www.are.na/anne-lee-steele/supply-chains-nxeaga7ntc4>.

[2] For a full bibliographic resource on how supply chains are addressed in various fields, see Matthew Hockenberry's supply studies syllabus: <https://supplystudies.com/>.

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