Interface Access Loss

I want to begin this talk at the end -- by which I mean the end of property - at least according to the cyber-utopian account of things, where digital file sharing and online communication *liberate culture* from corporations and their drive for profit. This is just one of the promised forms of emancipation -- property, in a sense, was undone. People, on a massive scale, used *their* computers and *their* internet connections to share digitized versions of *their* objects with each other, quickly producing a different, *common* form of ownership. The crisis that this provoked is well-known -- it could be described in one word: Napster. What is *less* recognized - because it is still very much in process - is the subsequent undoing of property, of both the private and common kind. What follows is one story of "the cloud" -- the post-dot-com bubble techno-super-entity -- which sucks up property, labor, and free time.

Object, Interface

It's debated whether the growing automation of production leads to global structural unemployment or not -- Karl Marx wrote that "the self-expansion of capital by means of machinery is thenceforward directly proportional to the number of the workpeople, whose means of livelihood have been destroyed by that machinery" - but the promise is, of course, that when robots do the work, we humans are free to be creative. Karl Kautsky predicted that increasing automation would actually lead, not to a mass surplus population or widespread creativity, but something much more mundane: the growth of clerks and bookkeepers, and the expansion of unproductive sectors like "the banking system, the credit system, insurance empires and advertising."

Marx was analyzing the number of people employed by some of the new industries in the middle of the 19th century: "gas-works, telegraphy, photography, steam navigation, and railways." The facts were that these industries were incredibly important, expansive and growing, highly mechanized.. and employed a very small number of people. It is difficult not to read his study of these technologies of connection and communication - against the background of our present moment, in which the rise of the Internet has been accompanied by the deindustrialization of cities, increased migrant and mobile labor, and jobs made obsolete by computation.

There are obvious examples of the impact of computation on the workplace: at factories and distribution centers, robots engineered with computer-vision can replace a handful of workers, with a savings of millions of dollars per robot over the life of the system. And there are less apparent examples as well, like algorithms determining when and where to hire people and for how long, according to fluctuating conditions.

Both examples have parallels within computer programming, namely **reuse** and **garbage collection**. Code reuse refers to the practice of writing software in such a way that the code can be used again later, in another program, to perform the same task. It is considered wasteful to give the same time, attention, and energy to a function, because the development environment is not an assembly line - *a programmer shouldn't repeat*. Such repetition then gives way to copy-and-pasting (or merely *calling*). The analogy here is to the robot, to the replacement of human labor with technology.

Now, when a program is in the midst of being executed, the computer's memory fills with data -- but some of that is obsolete, no longer necessary for that program to run. If left alone, the memory would become clogged, the program would crash, the computer might crash. It is the role of the garbage collector to *free up* memory, deleting what is no longer in use. And here, I'm making the analogy with flexible labor, workers being made redundant, and so on.

In Object-Oriented Programming, a programmer designs the software that she is writing around "objects," where each object is conceptually divided into "public" and "private" parts. The public parts are accessible to other objects, but the private ones are hidden to the world outside the boundaries of that object. It's a "black box" - a thing that can be *known* through its inputs and outputs - even in total ignorance of its internal mechanisms. *What difference does it make* if the code is written in one way versus an other .. if it behaves the same? As William James wrote, "If no practical difference whatever can be traced, then the alternatives mean practically the same thing, and all dispute is idle."

By merely *having* a public interface, an object is already a social entity. It makes no sense to even *provide* access to the outside if there are no potential objects with which to interact! So to

understand the object-oriented program, we must scale up - not by increasing the size or complexity of the object, but instead by increasing the number and types of objects such that their relations become more dense. The result is an intricate machine with an on and an off state, rather than a beginning and an end. Its parts are interchangeable -- provided that they reliably produce the same behavior, the same inputs and outputs. Furthermore, this machine can be modified: objects can be added and removed, changing but not destroying the machine; and it might be, using Gerald Raunig's appropriate term, "concatenated" with other machines.

Inevitably, this paradigm for describing the relationship between software objects spread outwards, subsuming more of the universe outside of the immediate code. External programs, powerful computers, banking institutions, people, and satellites have all been "encapsulated" and "abstracted" into objects with inputs and outputs. Is this a conceptual reduction of the richness and complexity of reality? Yes, but only partially. It is also a real description of how people, institutions, software, and things are being brought into relationship with one another according to the demands of networked computation.. and the expanding field of objects are exactly those entities integrated into such a network.

Consider a simple example of decentralized file-sharing: its diagram might represent an object-oriented piece of software, but here each object is a person-computer, shown in potential relation to every other person-computer. Files might be sent or received at any point in this machine, which seems particularly oriented towards circulation and movement. Much remains private, but a collection of files from every person is made public and opened up to the network. Taken as a whole, the entire collection of all files - which on the one hand exceeds the storage capacity of any one person's technical hardware, is on the other hand *entirely available* to every person-computer. If the files were books.. then this collective collection would be a public library.

In order for a system like this to work, for the inputs and the outputs to actually engage with one another to produce action or transmit data, there needs to be something in place already to enable meaningful couplings. Before there is any interaction or any relationship, there must be some common ground in place that allows heterogenous objects to 'talk to each other' (to use a phrase from the business casual language of the Californian Ideology). The term used for such a common ground - especially on the Internet - is **platform**, a word for that which *enables and anticipates*

future action *without directly producing it*. A platform provides tools and resources to the objects that run “on top” of the platform so that those objects don't need to have their own tools and resources. In this sense, the platform offers itself as a way for objects to externalize (and reuse) labor. Communication between objects is one of the most significant actions that a platform can provide, but it requires that the objects conform some amount of their inputs and outputs to the specifications dictated by the platform.

But haven’t I only introduced another coupling, instead of between two objects, this time between the object and the platform? What I'm talking about with "couplings" is the meeting point between things - in other words, an “interface.” In the terms of OOP, the interface is an abstraction that defines what kinds of interaction are possible with an object. It maps out the public face of the object in a way that is legible and accessible to other objects. Similarly, computer interfaces like screens and keyboards are designed to meet with human interfaces like fingers and eyes, allowing for a specific form of interaction between person and machine. Any coupling between objects passes through some interface and every interface obscures as much as it reveals - it establishes the boundary between what is public and what is private, what is visible and what is not. The dominant aesthetic values of user interface design actually privilege such concealment as “good design,” appealing to principles of simplicity, cleanliness, and clarity.

Cloud, Access

One practical outcome of this has been that there can be tectonic shifts behind the interface - where entire systems are restructured or revolutionized - without any interruption, as long as the interface itself remains essentially unchanged. In Pragmatism’s terms, a successful interface keeps any difference (in back) from making a difference (in front). Using books again as an example: for consumers to become accustomed to the initial discomfort of purchasing a product online instead of from a shop, the interface needs to make it so that “buying a book” is something that could be interchangeably accomplished either by a traditional bookstore or the online "marketplace" equivalent. But behind the interface is Amazon, which through low prices and wide selection is the most visible platform for buying books and uses that position to push retailers and publishers both to, at best, the bare minimum of profitability.

In addition to selling things to people and collecting data about its users (what they look at and what they buy) to personalize product recommendations, Amazon has also made an effort to be a platform for the technical and logistical parts of *other retailers*. Ultimately collecting data from them as well, Amazon realizes a competitive advantage from having a comprehensive, up-to-the-minute perspective on market trends and inventories. This volume of data is so vast and valuable that warehouses packed with computers are constructed to store it, protect it, and make it readily available to algorithms. Data centers, such as these, organize how commodities circulate (they run business applications, store data about retail, manage fulfillment) but also - increasingly - they hold the commodity itself - for example, the book. Digital book sales started the millennium very slowly but by 2010 had overtaken hardcover sales.

Amazon's store of digital books (or Apple's or Google's, for that matter) is a distorted reflection of the collection circulating within the file-sharing network, displaced from personal computers to corporate data centers. Here are two regimes of digital property: the swarm and the cloud. For swarms (a reference to swarm downloading where a single file can be downloaded in parallel from multiple sources) property is held in common between peers -- however, property is positioned out of reach, on the cloud, accessible only through an interface that has absorbed legal and business requirements.

It's just half of the story, however, to associate the cloud with mammoth data centers; the other half is to be found in our hands and laps. Thin computing, including tablets and e-readers, iPads and Kindles, and mobile phones have co-evolved with data centers, offering powerful, lightweight computing *precisely because so much processing and storage has been externalized*.

In this technical configuration of the cloud, the thin computer and the fat data center meet through an interface, inevitably clean and simple, that manages access to the remote resources. Typically, a person needs to agree to certain "terms of service," have a unique, measurable account, and provide payment information; in return, access is granted. This access is not ownership in the conventional sense of a book, or even the digital sense of a file, but rather a license that gives the person a "non-exclusive right to keep a permanent copy… solely for your personal and non-commercial use," contradicting the First Sale Doctrine, which gives the "owner" the right to sell, lease, or rent their copy to anyone they choose at any price they choose. The doctrine,

established within America's legal system in 1908, separated the rights of reproduction, from distribution, as a way to *"exhaust"* the copyright holder's control over the commodities that people purchased.. legitimizing institutions like used book stores and public libraries. Computer software famously attempted to bypass the First Sale Doctrine with its "shrink wrap" licenses that restricted the rights of the buyer once she broke through the plastic packaging to open the product. This practice has only evolved and become ubiquitous over the last three decades as software began being distributed digitally through networks rather than as physical objects in stores. Such contradictions are symptoms of the shift in property regimes, or what Jeremy Rifkin called “the age of access.” He writes that “property continues to exist but is far less likely to be exchanged in markets. Instead, suppliers hold on to property in the new economy and lease, rent, or charge an admission fee, subscription, or membership dues for its short-term use.”

Thinking again of books, Rifkin’s description gives the image of a paid library emerging as the synthesis of the public library and the marketplace for commodity exchange. Considering how, on the one side, traditional public libraries are having their collections deaccessioned, hours of operation cut, and are in some cases being closed down entirely, and on the other side, the traditional publishing industry finds its stores, books, and profits dematerialized, the image is perhaps appropriate. Server racks, in photographs inside data centers, strike an eerie resemblance to library stacks - - while e-readers are consciously designed to look and feel something like a book. Yet, when one peers down into the screen of the device, one sees both the book - and the library.

Like a Facebook account, which must uniquely correspond to a real person, the e-reader is an individualizing device. It is the object that establishes trusted access with books stored in the cloud and ensures that each and every person purchases their own rights to read each book. The only transfer that is allowed is of the device itself, which is the thing that a person actually does own. But even then, such an act must be reported back to the cloud: the hardware needs to be de-registered and then re-registered with credit card and authentication details about the new owner.

This is no library - or it's only a library in the most impoverished sense of the word. It is a new enclosure, and it is a familiar story: things in the world (from letters, to photographs, to albums, to books) are digitized (as emails, JPEGs, MP3s, and PDFs) and subsequently migrate to a remote

location or service (Gmail, Facebook, iTunes, Kindle Store). The middle phase is the biggest disruption, when the interface does the poorest job concealing the material transformations taking place, when the work involved in creating those transformations is most apparent, often because the person themselves is deeply involved in the process (of ripping vinyl, for instance). In the third phase, the user interface becomes easier, more "frictionless," and what appears to be just another application or folder on one's computer is an engorged, property-and-energy-hungry warehouse a thousand miles away.

Capture, Loss

Intellectual property's enclosure is easy enough to imagine in warehouses of remote, secure hard drives. But the cloud internalizes *processing* as well as storage, capturing the new forms of co-operation and collaboration characterizing the new economy and its immaterial labor. Social relations are transmuted into database relations on the "social web," which absorbs self-organization as well. Because of this, the cloud impacts as strongly on the production of publications, as on their consumption, in the tradition sense.

Storage, applications, and services offered in the cloud are marketed for consumption by authors and publishers alike. Document editing, project management, and accounting are peeled slowly away from the office staff and personal computers into the data centers; interfaces are established into various publication channels from print on demand to digital book platforms. In the fully realized vision of cloud publishing, the entire technical and logistical apparatus is externalized, *leaving only* the human labor.. and their thin devices remaining. Little distinguishes the author-object from the editor-object from the reader-object. All of them.. maintain their position in the network by paying for lightweight computers and their updates, cloud services, and broadband internet connections.

On the production side of the book, the promise of the cloud is *a recovery* of the profits "lost" to file-sharing, as all that exchange is disciplined, standardized and measured. Consumers are finally promised the access to the history of human knowledge that they had already improvised by themselves, but now without the omnipresent threat of legal prosecution. One has the sneaking suspicion though.. that such a compromise is as hollow.. as the promises to a desperate city of the

jobs that will be created in a new constructed data center - - and that pitting “food on the table” against “access to knowledge” is both a *distraction from* and a *legitimation of* the forms of power emerging in the cloud. It's a distraction because it's by *policing access to knowledge* that the middle-man platform can extract value from publication, both on the writing and reading sides of the book; and it's a legitimation because *the platform poses itself* as the *only entity* that can resolve the contradiction between the two sides.

When the platform recedes behind the interface, these two sides *are* the the most visible antagonism - in a tug-of-war with each other - - yet neither the “producers” nor the “consumers” of publications are becoming more wealthy, or working less to survive. If we turn the picture sideways, however, a new contradiction emerges, between the indebted, living labor - of authors, editors, translators, and readers - on one side, and on the other.. data centers, semiconductors, mobile technology, expropriated software, power companies, and intellectual property.

The talk in the data center industry of the *“industrialization”* of the cloud refers to the scientific approach to improving design, efficiency, and performance. But the term also recalls the basic narrative of the Industrial Revolution: the movement from home-based manufacturing by hand to large-scale production in factories. As desktop computers pass into obsolescence, we shift from a networked, but small-scale, relationship to computation (think of “home publishing”) to a reorganized form of production that puts the accumulated energy of millions to work through these cloud companies and their modernized data centers.

What *kind* of buildings are these blank superstructures? Factories for the 21st century? An engineer named Ken Patchett described the Facebook data center that way in a television interview, “This is a factory. It’s just a different kind of factory than you might be used to.” Those factories that we’re “used to,” continue to exist (at Foxconn, for instance) producing the infrastructure, under *recognizably* exploitative conditions, for a “different kind of factory,” - a factory that extends far beyond the walls of the data center.

But the idea of the factory is only part of the picture - this building is also a mine.. and the dispersed workforce devote most of their waking hours to *mining-in-reverse*, packing it full of data, under the expectation that someone - soon - will figure out how to pull out something valuable.

Both metaphors rely on the image of a mass of workers (dispersed as it may be) and leave a darker and more difficult possibility: the data center is like the hydroelectric plant, damming up property, sociality, creativity and knowledge, while engineers and financiers look for the algorithms to release the accumulated cultural and social resources on demand, as profit.

This returns us to the interface, site of the struggles over the management and control of access to property and infrastructure. Previously, these struggles were situated within the computer-object and the implied freedom provided by its computation, storage, and possibilities for connection with others. Now, however, the eviscerated device is more interface than object, and it is exactly here at the interface that the new technological enclosures have taken form (for example, see Apple's iOS products, Google's search box, and Amazon's "marketplace"). Control over the interface is guaranteed by control *over the entire techno-business stack*: the distributed hardware devices, centralized data centers, and the software that mediates the space between. Every major technology corporation must now operate on all levels to protect against any loss.

There is a centripetal force to the cloud and this essay has been written in its irresistible pull. In spite of the sheer mass of capital that is organized to produce this gravity and the seeming insurmountability of it all, there is no chance that the system will absolutely manage and control the noise within it. Riots break out on the factory floor; algorithmic trading wreaks havoc on the stock market in an instant; data centers go offline; 100 million Facebook accounts are discovered to be fake; the list will go on. These cracks in the interface don't point to any possible future, or any desirable one, but they do draw attention to openings that might circumvent the logic of access.

"What happens from there is another question." This is where I left things off in the text when I finished it a year ago. It's a disappointing ending: we just have to invent ways of occupying the destruction, violence and collapse that emerge out of economic inequality, global warming, dismantled social welfare, and so on. And there's not much that's happened since then to make us very optimistic - maybe here I only have to mention the NSA. But as I began with an ending, I really should end at a beginning.

I think we *were* obliged to adopt a negative, critical position in response the cyber-utopianism of

the last almost 20 years, whether in its naive or cynical forms. We had to identify and theorize the darker side of things. But it can become habitual, and when the dark side materializes, as it has over the past few years - so that everyone knows the truth - then the obligation flips around, doesn't it? To break out of habitual criticism as the tacit, defeated acceptance of *what is*. But, what could be? Where do we find new political imaginaries? Not to ask what is the bright side, or what can we do to cope, but what are the genuinely emancipatory possibilities that are somehow still latent, buried under the present - or emerging within those ruptures in it? - - - I can't make it all the way to a happy ending, to a happy beginning, but at least it's a beginning and not the end.