MODULATED CITIES

NETWORKED SPACES, RECONSTITUTED SUBJECTS

HELEN NISSENBAUM AND KAZYS VARNELIS

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The Situated Technologies Pamphlet Series extends a discourse initiated in the summer of 2006 by a three-month-long discussion on the Institute for Distributed Creativity (iDC) mailing list that culminated in the Architecture and Situated Technologies symposium at the Urban Center and Eyebeam in New York, co-produced by the Center for Virtual Architecture (CVA), the Architectural League of New York and the iDC. The series explores the implications of ubiquitous computing for architecture and urbanism: how our experience of space and the choices we make within it are affected by a range of mobile, pervasive, embedded, or otherwise "situated" technologies. Published three times a year over three years, the series is structured as a succession of nine "conversations" between researchers, writers, and other practitioners from architecture, art, philosophy of technology, comparative media studies, performance studies, and engineering.

www.situatedtechnologies.net

Concluding the Situated Technologies Pamphlets series, Kazys Varnelis and Helen Nissenbaum initiate a redefinition of privacy in the age of big data and the networked, geo-spatial environment, and question the implications for the construction of contemporary subjectivity.

This pamphlet is charged with vital intellectual tensions. Contested questions include: Are policy decisions made through design choices? Are all values and behavioral norms vulnerable to the shaping forces of architectural design, physical and digital? Do technical systems have independent causal powers or do they reflect cultural ideals that are already in the air, conveying intentions that are already seeded in social and political life? What are technology's unintended implications? Do Facebook or Foursquare design privacy behavior? Do they normalize privacy behaviors and practices or do they accommodate the desires of "users," of society? Varnelis argues that we are giving up our privacy all too willingly. Does Facebook have the power to steer the direction of social mores or is Facebook part of a societal shift?

Nissenbaum positions herself against the privacy-publicity dichotomy, as it is no longer helpful in understanding individual privacy. Instead, she calls for a contextual understanding of informational norms prescribing the flow of personal information. She strictly rejects moral claims by the likes of Foursquare on the information that flows through their system. For Nissenbaum, values are context-specific and the integrity of the information should not be altered when it shifts through different contexts.

Data profiling, aggregation, analysis, and sharing are broad and hidden. It's harder than ever to constrain the flow of data about us; we no longer surf the net, but the Internet surfs us, Nissenbaum poses. The authors ask how we can widely share our data without causing harm. Varnelis argues that the standards of disclosure have changed and that people are made to believe that privacy is the price for utility and convenience. But he also suggests that many of us have become accustomed to the thrill of watching and being watched. Sometimes we take pleasure in being stalked by our peers. We might behave in public like we might have previously done so only in private, but giving up information does not always suggest giving up privacy. We might willingly share data with friends but that does not mean that we consent to sharing these data with third party intermediaries.

Digital technologies permeate our life and desires and make the walls of the built environment more porous; bodies become merely nodes in the network. The built environment is no longer the benchmark when it comes to decisions about privacy. The authors concede that while far-reaching surveillance online is broadly accepted, many would be shocked if such fine-grained tracking would occur when they are walking through a shopping mall.

We are habituated to giving up data: to our friends and nameless corporations. Our data become a currency for expressing our friendships. Networked surveillance is asymmetrical; it is slanted toward corporate interests and in the United States much of this commercial reconnaissance is unregulated. The authors push for transparency, first and foremost of the systems that affect people's well-being and life prospects. We have little to no recourse to demand the data that are collected about us. We don't know what is collected, with whom it is shared and who profits. Why can't we get a copy of our network data? There is no accountability but much anxiety in the face of vulnerability.

How can we insulate ourselves from being exploited?

The enormous scale and complexity of big data sets and the legal frameworks around privacy makes them hard to comprehend. How would anybody with a job and a family find the time to read the many pages of the iTunes Terms of Service declaration, for example? Power takes advantage of complexity.

Varnelis and Nissenbaum do not ask us to retreat from digital media but they caution that suffocating surveillance could lead to paralyzed dullness. Alternatively, they advance interventions like protest, work toward regulation, policy changes, and re-design as possible counter strategies.

Omar Khan, Trebor Scholz and Mark Shepard

THE AUTHORS

Helen Nissenbaum is Professor of Media, Culture and Communication, and Computer Science, at NYU, where she is also Senior Faculty Fellow of the Information Law Institute. Her book *Privacy in Context: Technology, Policy, and the Integrity of Social Life* (Stanford University Press, 2010) accounts for privacy threats posed by IT and digital medial systems in terms of the theory of contextual integrity. Other research and publications address trust online, security, and values in technical design, with case studies in search engines, digital games, facial recognition technology, and health information systems.

www.nyu.edu/projects/nissenbaum

Kazys Varnelis is the Director of the Network Architecture Lab at the Columbia University Graduate School of Architecture, Planning, and Preservation. With Robert Sumrell, in the architectural collective AUDC, he published *Blue Monday* (Actar, 2007). He has edited *Networked Publics* (MIT Press, 2008), *The Infrastructural City: Networked Ecologies in Los Angeles* (Actar, 2009), and *The Philip Johnson Tapes* (The Monacelli Press, 2008).

www.networkarchitecturelab.org
www.varnelis.net

HFN **Helen Nissenbaum:** Recently, I read about Footpath, a device that senses peoples' movements by the signal finger-prints of their cellular phones.[i] Those of us hyper-attuned to the variety of ways digital systems and networks threaten individual autonomy often see the reliable solidness of built space as a helpful frame of reference. If "walls have ears," they are those of treasonous confidantes or nosy eavesdroppers; otherwise, walls are safe barriers, and the doorways, portals, paths, and roadways that connect physical spaces are clearly delimited. Footpath, not unlike many such emerging augmentations of physical spaces, unsettles these assumptions, not only due to its capacity for surreptitious surveillance and for commandeering our most intimate devices to indeterminate ends, but also in its potential to link our physical presence easily and directly with other incorporeal information about us. Deployed in shopping malls, at a point-of-sale, for example, Footpath could connect generalized foot-traffic patterns and physical presence with payment, purchase, and credit information, in turn unearthing the secrets of whatever other information aggregations the system may plumb.[ii] Walking around the mall, we are no longer islands, presenting not simply as bodies, autonomous actors, moving about in space; instead, we are but nodes in information networks, networks defining who we are and holding us to account to that record. It is as if the architects of built physical space, finding it wanting against the backdrop of the digital, strive to meet the digital's specifications—all the while those of us concerned about the shifting parameters of digital networks and spaces have, ironically, used the physical as our benchmark.

KV **Kazys Varnelis:** RFIDS (Radio Frequency IDentification chips) make things even worse: if you have an RFID chip embedded in your clothing, a sensing system could identify you and your purchasing history as you come within its proximity. We are told, however, that such systems have not yet been exploited to the fullest. For now, at least, the data collected is anonymous, used for "ethnographic" research into how individuals shop or behave.[iii]

But the potential for *Minority Report*-style surveillance is growing.[iv] If we are sure that our every move online is tracked and monitored, it seems likely that a walk in the mall, or for that matter, through the city, will be as well.

Your observation that we are no longer islands, but rather nodes in a network, prompts me to consider what this insight means. What you point to isn't just a change in our status at malls; it's an expression of the very ideology of our day, the network ideology.[v] Sociologists consider human societies in terms of networks, architects design buildings as networks within networks,[vi] entomologists study networks of bees, corporations think of themselves as networked,[vii] and on and on. The network, it seems, is a new universal, much as the machine was in the late nineteenth and early twentieth century.[viii]

Now some of these deployments of the network are legitimate epistemological uses, but others are the product of fabricating out of whole cloth what you want to see—or the product of finding what you want to look for. Network ideologies, like all ideologies up to a point, become a self-fulfilling prophecy; it serves to make networks seem natural, reifies them, as Roland Barthes might have said, into a mythology.[ix] This naturalization of networks is profoundly dangerous since over the last two decades, power has reconfigured itself in network form.[x]

Gilles Deleuze examines this condition in his "Postscript on the Society of Control," and observes that with power shifting to a networked form, our relationship to space changes.[xi] Thus when it comes to your observation about space, for Deleuze enclosures—like the walls that you invoke—give way to modulations, constantly shifting sets of parameters that we have to learn to navigate anew. Instead of discrete institutions like "school," "work," "the family," and so on, we are faced with unceasingly shifting boundaries cutting across physical and social contexts.

Some architects have tried to represent this fluidity, even celebrate it, in structures like the Guggenheim Bilbao, but its impact on space goes deeper than surface architectural formalism. Modulations go through walls, around corners, spilling into the street and down into the subway. In this sense, buildings like Frank Gehry's get it wrong. No matter how complex their curves, they remain prosaic, static structures. It's the invisible city that we are shaping through ubiquitous computing and mobile telecommunications devices that matters.

Is there something that gives away that I wrote this paragraph on a train passing through Newark? Or the first paragraph in this section at Columbia's Studio-X facility in Soho four days beforehand? Of course

our first instinct is to say that's not important, but it's a new way of writing, a way of writing crisscrossed, for better or worse, by the operations of modulations.

How do we navigate a contemporary condition in which boundaries are fluid and constantly shifting, instead of discreet and identifiable? And what do we do with a legal system that has its origins in that nineteenth-century world of boundaries and enclosures? What are the public and the private today?

HFN When people talk of the changing contours of public and private brought about by digital technology, or when they suggest replacing the singular public with the plural publics to cope with some of its disruptions, I worry that a finer-grained appreciation and analysis of this change is getting buried in a kind of dichotomous thinking.[xiii] Although a full discussion of the concepts of public and private has no place here, it is worth noting that these terms each have both descriptive meaning—for example, when asserting that a sidewalk or city park is public and someone's home is private—and normative meaning—that is, invoking respective clusters of legitimate assumptions and expectations about what is and is not acceptable on a sidewalk or someone's home, respectively.[xiv] When considering developments in information systems and digital media that have challenged the dichotomy of public and private as traditionally conceived (or constructed), an examination of quite close details is often necessary to tease apart those normatively significant changes that challenge assumptions and expectations from those that do not. I have been particularly attuned to the inferences people have drawn about privacy on the basis of such developments, the most extreme of which suggesting that privacy is no longer possible, relevant, or even desirable in this brave new world.[xv]

Over the past two decades, several of these digital developments have grabbed public attention and raised public anxiety. I wish to put three of these changes "on the table" that expose features of this puzzling terrain and have served as touchstones for my own thinking.

One development is the embedding of networked devices throughout physical space—commonly referenced as an Internet of Things—mobile or fixed, in spaces public or private (again, as traditionally con-

ceived).[xvi] Although there is potentially great variability in how the systems operating these devices function, the possibility of network-enabled controls on flows of information challenges the construct of a public-private divide. And in at least some models of machine it is easy to see how these embedded devices may serve to penetrate boundaries. Social networks, such as Facebook and Twitter, are a second development to rattle settled conceptions of public and private, as individuals appear to discard inhibitions, behaving "in public" as they might previously only have behaved "in private." While some observers celebrate these developments for breaking down public-private barriers,[xvii] others, while remaining committed to a productive cleft between public and private, find the singular public to be limiting in explanatory and normative power and suggest devolution to plural or differentiated publics as more useful to networked societies.[xviii] A third development has been the online exposure of implicit popular assumptions about what can be expected in public venues—ironically, through the contravention of those expectations. Contemporaneously with our writing, two cases serve as illustrations: one, in the aftermath of the June 2011 Vancouver Stanley Cup riots, was the identification of the famous kissing couple through crowd sourcing[xix]; the other was the use of facial recognition technologies to identify individuals participating in August's London riots.[xx] Setting aside details of these two events, relevant here is the level of interest they stirred in news media around the world; finding these uses of digital technologies to identify people "in public" was sufficiently newsworthy for front-page stories. The incidents were unsettling, and hence newsworthy, because they overturned robust, longstanding expectations about the limits on what others may see and know about us, even in public.

What do these developments mean? Are they causes for resistance, or merely inexorable stages in a progression to which we have already assented? What theories, findings, insights and experiences can enlighten or guide us?

KV For me, Jürgen Habermas's idea of the public sphere is the point of departure. In Habermas's view, the public sphere coalesced in the coffee houses and salons of eighteenth-century Britain, France, and Germany, and lasted in its original form until the mid-nineteenth century.[xxi] The public sphere served to balance governmental, clerical and private interests, acting as a venue of debate in which issues

of common concern could be discussed. Yet as capitalism developed, the uneven distribution of wealth increased and women and the poor came to demand their own interests, most notably equal economic opportunity; this fragmentation into what we would now call "identity politics" led to the public sphere's undoing; for Habermas, this introduction of specific—as opposed to universal— claims couple with the growth of mass media, which again had vested interests, to undo the public sphere.

Certainly I think that social justice is important and the construction of a universalizing discourse itself is riven with problems, but Habermas's lament nonetheless has a point. At one time we had an ideal of a public. Such a public may have never have really existed, but people shared a belief in it. And most social justice movements were not so much attacks against the public sphere as they were attempts to join it as equals.[xxii]

If Habermas avers that the public sphere was extinguished in the nineteenth century, as an ideal it endured much longer, until the late twentieth century. As late as the 1950s we had commonly held ideas of what being a citizen entailed and what rights it promised. This is not to say that this monolithic ideal public wasn't repressive or that it wasn't manipulated by big media, nor that there weren't counter publics that contested the claims of the dominant discourse[xxiii]; but there was still a shared belief in there being one polis for the majority. We've done so much since the rise of postmodernism to fight this homogeneity, but we've done so little to rebuild notions of a shared space. Perhaps something may grow out of the Commons movement that has emerged out of the Internet, but that possibility seems far off as yet.[xxiv]

The concept of networked publics has been useful for me in terms of trying to understand the post-public sphere condition. As we defined the phrase at the Annenberg Center for Communication, networked publics are groups of often-widely-dispersed individuals who come together online (although these interactions sometimes erupt in physical space as well) to share a common experience or interest.[xxv] Although some researchers refer to social networks like Facebook and Myspace as networked publics, that's a misstep; these are corporate-sponsored platforms, not publics.[xxvi] But what, then, is a public? Today, it seems to be an interest group, whether social, cultural, or political. Multiple publics, in other words, are opposed to the public singular—these net-

worked publics are sectarian by nature, divisive. Whether such publics can come together to make decisions democratically is still unclear, but the signs aren't encouraging.[xxvii] To be sure, networked publics give us a great feeling of belonging: "look, here's a group of people across the country or the globe obsessed with the same interest I'm obsessed with! And here's another!" But we don't have much ability to communicate across those boundaries of narrow affinity; shared private interests trump the public definitively.

Under network culture the incommensurability of discourses that Lyotard observed defines postmodern knowledge has spread to the political realm.[xxviii] If a unified public sphere—no matter how flawed—is no longer an ideal desirable or even possible to aspire to, what do we have left? I don't see Michael Hardt and Antonio Negri's "multitude" as an answer.[xxix]

If a common public no longer exists, then we shouldn't be too surprised that privacy—that which is not public—is muddled as well.

The lack of distinction between public and private is played out in space. Under the legal and cultural norms of postmodernism, spaces that appear to be public frequently turn out not to be (the generic shopping mall is one example, but so is Zuccotti Park—site of the Occupy Wall Street encampment—which is in fact owned by a corporation), with consequences for our ability to both experience privacy and engage in civic action.[xxx] For example, in 2003, shortly before the beginning of the Iraq War, Stephen Downs, a lawyer walked into the Crossgates Mall near Albany, New York, bought a t-shirt saying "Give Peace a Chance" at a shop in the mall and sat down to eat in the food court. When a guard asked him to leave, he refused and was subsequently arrested for trespassing.[xxxi] In the end, the mall dropped the charges and the guard was fired.

But under network culture, matters are more complex yet, since so many of us inhabit the space of the Net as much as we inhabit physical space. What's public out on the Net? Anything? Everything?

Making matters worse, top all these complexities off with the permeation of physical space by network space. When I'm in a city and I spot an open Wi-Fi network, I hop on to it. Yet I've read that doing so is

illegal.[xxxii] There are no indications of this restriction anywhere! My iPhone gladly suggests that I join these networks; is it aiding and abetting? If a minor uses it, is an iPhone, and by extension Apple Corporation, contributing to juvenile delinquency? Conversely, when I'm wandering around using that same phone, Carrier IQ is logging the data, sucking down information about me akin to what Footpath is gathering without my consent or knowledge.[xxxiii]

It's enough to make my head ache thinking about these permutations, and I often think that's the point—that this overcomplexity works against us. We can't understand it, so we just give up and go with the flow (of privacy out of our hands!). Or, perhaps, in the future more of us will wind up disconnecting from the Net, perhaps even carrying umbrellas to confound CCD cameras that are out to track us, like the one we find in Mark Shepard's Sentient City Survival Kit.

HFN In one of the most influential early papers on privacy law, Jerry Kang, a professor of law at UCLA, set out to demonstrate how different and challenging the dynamics of "cyberspace" are, and why it is crucial to reconsider privacy in this light.[xxxiv] Wanting to shock his readers, Kang asks us to imagine shopping in a mall under conditions similar to those of shopping online, "in cyberspace."[xxxv] Imagine having someone follow you around from store to store, monitoring not only what you purchase but even what you looked at. Imagine, further, that this watcher not only observes you but also knows who you are, for this is the world enabled by the architecture and protocols of the Internet. We realize that through this analogy, Kang intends to evoke so great a sense of suffocation and outrage that readers will immediately understand why new laws must be passed in order to maintain online the liberties that we have taken for granted offline, liberties granted, if you will, by the architectures of the physical environment. And if the anxieties provoked by the claustrophobia of e-commerce are severe, such anxiety is even more warranted in the face of our vulnerability, online, to the concentrated power of state actors.

Kang's message is clear: core human values can be threatened by the migration of activities and practices to "cyberspace," or in contemporary parlance, by digitally mediated activities and practices. The answer is not a retreat from new technologies, but a recognition of what is at stake and a move to compensate for unacceptable changes (losses)

Mark Shepard, *CCD-Me-Not-Umbrella, Sentient City Survival Kit* (2010).

with—in this instance—explicit law and regulation. More than a decade later, however, as many of us continue the struggle to sustain the integrity of the different spheres of social life by insisting on constraints on information flows (particularly as it they are mediated online) we are confronting an odd twist of irony. Instead of sustaining the freedoms of physical space online, the conditions of Kang's cyberspace seem increasingly to be replicated in (or mapped onto) physical space—social networks, an Internet of Things, pervasive computing, RFID, GPS-enabled devices, location tracking systems and technologies (such as that used by Footpath), and identification through crowd-sourcing (a so-called "human flesh" search engine)[xxxvi] As venture capitalist Harry Weller put it in a recent interview, "now instead of us surfing the Internet, the Internet is surfing us."[xxxvii]

KV One of the arguments I make in my recent work on network culture is that thinking of "cyberspace" and "new media" as somehow discrete from the physical world has been a red herring for those of us concerned about freedom and autonomy online and off. In *Spook Country,* William Gibson talks about cyberspace "everting," or mapping onto physical space. It often seems that way these days, but it's not just a simple relationship of one-way influence. Rather, the same societal forces are shaping both networked and physical spaces.[xxxviii] Aliens haven't delivered recent digital technology to us, individuals produce it and corporations respond to broader needs and desires in society.

In the case of Kang's analogy about someone following us around a mall, it was the widespread migration from cash to credit and debit transactions in the 1990s that allowed such surveillance to be possible. We've created laws to help consumers, but corporations seem inevitably to find ways to exploit their customers. For example, American Express lowered the credit limits of individuals who shopped frequently at Walmart because as a group, Walmart shoppers statistically have a poor history of repayment.[xxxix] On the other hand, if you buy premium birdseed, it turns out that corporations can tell you are a good credit risk. Corporations know that about you.[xl] So we're already being followed around the shopping mall and, of course we're also being followed around the Internet: data mining of purchases is nothing new.

There's no question that digital technologies make this state of affairs possible, specifically database technologies, but merely looking at privacy

on the Internet or in the "Sentient City" seems to me to be misplaced. We're talking about broader changes in society. Changes that are closely tied and even enabled by technology, but that can't be reduced to it.

That said, new technologies often do get ahead of the law. Many forms of corporate surveillance on the Internet are unregulated. Even when you try to browse anonymously, corporations are always triangulating you, figuring out who you are and finding ways to exploit that data for their own advantage. If they don't want to be subjected to that sort of scrutiny, why should we be?

We have to be careful conceptually separating out online and offline, or even seeing the former as pervading the latter. What Kang's analogy lacks is the knowledge that in the last decade we have ceased to be frightened of that stalker following us in the mall. On the contrary, many of us are now eager to have everyone in the mall—storekeepers and other shoppers alike—follow us. There's a vast cultural shift afoot and it's not just that we're being monitored, it's that we are giving up our privacy willingly.

Here is another example: American Express and Foursquare have created an iPhone app, Social Currency, that allows users—it's targeted to young people—to share their online and offline purchases and desires with others.[xli] Now perhaps that application will not succeed; it seems like a dumb idea, but how different is it from recommendations-based merchants like Amazon, Netflix, iTunes, or even porn video sites, where users give up the record of their activity eagerly in order to have recommendations custom-tailored to them? Our reading, listening, and viewing habits and even sexual interests are in the hands of corporations to whom we've offered them up willingly.

HFN I see several points of agreement and a few where, perhaps, we differ. The Net is a construct no less than our physical, built environments, and shaped no less by social forces. That fact is undeniable. Like you (and others) I have resisted the idea of the Net as a discrete space, separable from the rest of life;[xlii] I find it useful, instead, to conceptualize the Net not as a distinct space or place but as a medium of activity and practice—action, transaction, interaction, communication, and so forth—with connections and flows that thread from Net to other media and back, including the spaces constructed from the physical,

built environment. Although there may be insulated activities that remain largely "on the Net," or "in physical space," for the most part what one does in one arena is thickly integrated with the other.[xliii]

But the digital medium has afforded actions and practices that were not previously possible. Just as telephones afforded communications at a distance as never before, and subsequent social, political, and cultural reverberations,[xliv] so too have digital media, in myriad ways that have been noted and analyzed by observers, pundits, and fellow academics. Yes, the infrastructure supporting credit cards affords surveillance of our purchases, but the ability to monitor mouse movements and click-streams affords surveillance of our attention and interests as well. Aggregated databases and data analytics, as you point out, have enabled new forms of knowledge as well as behavioral profiling, prediction, and manipulation. The digital media expands the range of our capabilities, not always for the better: early essentialist arguments such as those posited by Johnson and Post,[xlv] have in my view been effectively debunked by Larry Lessig and others,[xlvi] as have deterministic elements of Winner's position[xlvii] been effectively critiqued by social constructivists.[xlviii] Nevertheless, there is still much we can learn by linking social consequences to specific features of technical systems, despite the obvious mediation of surrounding circumstances and cultural and conceptual perspectives.

If you will allow me the assertion that information technologies and digital media enable an expanded range of human and social activity, this claim still leaves plenty of room for variation. Early versions of Internet and Web protocols enabled much of the activity that even in a short period we now take for granted, but subsequent developments (as we have learned from historians of the Net) were never inevitable. Frequently, they were the result of contestation driven by vested interests: for example, the adoption of a protocol for Web cookies that allowed for the placement of third-party cookies on a users' browser and the infrastructure of cross-site tracking that we experience today[xlix]—web cookies, of course, are small text files that pass between a user's browser memory and the websites they visit as a means of sustaining an ongoing relationship between the two.[l]

Yet it is as dangerous to subscribe to cultural determinism as it is to technological determinism; that is, to suggest that what *we* have is what *we* want and that culture is ultimately the determinant of our built

environments in physical and digital space, and even the integration of the digital with the physical and vice versa. For one, saying that what we have with our networked technologies is a function of "broader societal needs and desires," suggests a uniformity of societal needs and desires.[li] Although it is quite likely that what we have is a function of the needs and desires of certain slices of society and certain facets of culture, I am recommending that we examine which ones these are, and how the built environment plays into their power. Take the analogy of the lever: it is true that the invention of the lever facilitated new activities and accomplishments, but one could also argue that this technology redistributed the value of certain human capabilities, undermining the value of human physical strength for those ends to which levers could be applied. I want merely to note the problem of unintended consequences; perhaps no one wanted the problems of nuclear waste, or pollution from combustion engines, but here those problems are.[lii]

Along similar lines, I am wary of those who say that, now, we are giving up our privacy willingly. Such statements prey on ambiguity, verbal sleights of hand, that suit the interests well of those who prefer not to be constrained in their collection and use of information about people. First, giving up information is not the same as giving up privacy; rather, we give up privacy only when information is shared inappropriately, or contrary to expectations.[liii] When we willingly share information of our whereabouts with friends, say, when using FourSquare, we are not *necessarily* giving up privacy, because letting our friends know where we are is not unexpected or inappropriate sharing of information. Does that then mean that we are, or ought to be, "willingly" giving up information about our whereabouts to FourSquare the corporate entity? The fact that an intermediary has access to information we have willingly revealed to our friends does not necessarily give it a legitimate , moral, legal, or commercial claim to it. Likewise, when we use credit cards, traverse the Web, or use search engines, I do not think we are acceding to the unconstrained, onward flow of this information, nor its secondary use for the purpose of profiling us. Many years ago, the computer scientist Larry Hunter prophesied "Our revolution will not be in gathering data—don't look for TV cameras in your bedroom—but in analyzing the data that is already willingly shared."[liv] In other words, willingly sharing information does not amount to willingly giving up privacy, and willingly sharing information with one party does not amount to willingly sharing it with a third-party intermediary who happens to capture it along the way.

KV Well, yes, of course the Internet does create new possibilities, as do advances in data mining technologies, RFIDs, and all the rest. But essentializing arguments are still common, both in the press and in academe, particularly with regard to technology. It often seems to me that these discussions suggest that starting with network culture, the world became technological.[lv] Certainly the rate of technological change seems to have increased, yes, but it's not like there wasn't technology before 1993.[lvi]

As far as giving up privacy versus giving up information, the issue is precisely that: confusion between the two. We expect to share certain information to our friends, but in doing so we are also giving up the information to many other entities with whom we neither expect nor wish to share it. Moreover, since these corporate and governmental institutions have little accountability, we have no way of knowing what they know about us. Mind you, at least with the FBI, we can file a request under Freedom of Information Act. Why can't I find out what Apple knows about me?[lvii] Do they know I jailbreak my iPhones? Do they know what software I have installed on my Macs? What does Google know about me?[lviii] Do they share this information with Bank of America? And even if I had access to these corporate databases, how in the world could I keep track of how they were keeping track of me?

HFN Exactly! We should be demanding greater transparency from corporate actors who hold information about us because increasingly they wield power over us. For the most part, we don't begrudge our friends information because we trust in their benevolence, and we stand in voluntary and mostly reciprocal relationships to them. With corporate actors, our relationships are increasingly compelled yet, as you point out, without the protections that have evolved over centuries of political governance (at least, those present in justly governed societies!)

KV And yet somehow we don't make a big stink about this erosion of autonomy. There's no great demand for privacy among us. Oh, every now and then something flares up about the NSA, Carrier IQ, Google Street View, or Facebook, or whatever, but we're actually pretty restrained in our complaints. It's really rather peculiar. Is it that we've come to trust that just because the eyes that are watching us are (largely) algorithmic, it's not a matter of concern?

Or is it that platforms like Social Currency, Facebook, and FourSquare effectively train us to give up information? Once you become accustomed to sharing your intimate financial transactions or your every location with your friends as part of a social media game, then why not share that sort of information with faceless corporations?

So becoming corporate dupes is part of the problem. Another part, however, is that we don't understand what's going on and how to fight it. I recently upgraded iTunes and was faced with an eighty-page contract I had to negotiate. I couldn't modify any of it and I didn't have time to read it, so I just clicked "Accept." The document was just too complex for me to deal with. This observation leads to one of my main concerns today: the rise of complexity in everyday life. In his book *The Collapse of Complex Societies,* archaeologist Joseph Tainter suggests that overcomplexity has been the primary cause of collapse for previous societies.[lix] As societies develop, Tainter concludes, they develop complexity, building specialized social structures and creating varied social structures and roles to address their needs; for example, systems of taxation and government, university faculty in paleoanthropology and home inspectors. But complexity costs energy while—let's face it—very few of us are actually engaged in contributing energy to the "grid." Previous civilizations have collapsed when they could no longer sustain that complexity. Ours, of course, is the most advanced civilization ever and, consequently the most energy-hungry. We may yet see an unprecedented collapse in Tainter's terms.

There are other ways in which complexity troubles us in everyday life. I've recently moved and, in transferring my cable TV, Internet, and telephone service to the new house, I have had to spend hours upon hours dealing with Verizon. We're all familiar with this kind of frustrating experience. Of course, although some of this wasted time has been caused by the difficulty this large and complex corporation has in communicating between its different parts, some of it is a deliberate strategy to achieve consumer quiescence.

The reason I bring this up here is that obviously law is one of the more complex entities we run across. In the case of new social media, typically we sign away our rights because of the complexity of the legalese in Terms of Service (TOS) agreements. Who has the time to read these things? I'm sure the vast majority of us simply click "Accept" without

reading them. It's a matter of overcomplexity and our own inability to take the time to understand these legal documents. Corporations know this full well. Even if we read the TOS, would we be willing to forgo the benefits that these sites bring? In many cases, we would not.

This is no accident. In control society, power takes advantage of complexity. That we can't hope to understand the TOS helps the corporations. Or, take the stock market: even if we want to play the stock market, we can't really play it, that's up to the algorithmic traders, derivatives brokers, and hedge fund managers who better understand and can better take advantage of the insanely complex way it operates.

HFN I would like to come at some of the themes of our discussion with a hypothetical case. Consider the homes—houses, apartments, condominiums, etc.—most of us inhabit, comprising mostly opaque walls, a few transparent windows, lockable doors for entry and exit. To simplify matters, we can narrow down the scope of the case to the United States and to roughly contemporary times, though clearly these characteristics extend well beyond that frame. According to these material conditions—architectural, if you will—we modulate our behaviors depending on the varying degrees of exposure that are afforded by the walls, windows, and doors compared with, for example, when we are outside those walls, inside other people's homes, or on sidewalks, in parks and other public places. Now imagine that advances in materials allow us to build proverbial glass houses[lx]; this supposition is not entirely far-fetched, as we know from numerous skyscrapers with glass exteriors, including some that are residential.[lxi] You might wonder how we might react to such a possibility: whether we would adapt by getting used to being seen by others in circumstances of our lives in which we previously were not seen, or by seeking closed venues elsewhere for these circumstances. What might entice us to accede to such conditions? How much would we resist them if imposed on us?[lxii]

In the context of this specific case to the built environment more generally, a question to which I return is whether these basic architectural facts are a function of pre-existing needs to limit visual and informational exposure or, the other way round—that is, whether our activities and expectations are adapted to the constraints and affordances (to use terms popularized by Donald Norman) of the material environment, which may have acquired its character from an entirely independent

set of causes.[lxiii] Of course, the answer is likely to be, "a bit of both." However, as the number of networked nodes integrated into our work and home lives sharply rises the need becomes increasingly urgent to identify normative expectations that are powerful enough to shape material design, and to recognize those features of our material surroundings that having arisen independently of human activities yet still shape our expectations. The question we might ask in the case of private dwellings— "did the activities within require opaque walls or did the opacity of walls shape the activities within?"—can be extended to larger urban tracts, residential blocks, shopping areas, streets, parks, and so forth. About public areas, such as parks, the equivalent question might be, "do the conditions of visibility in a park shape our activities, or do the activities we strive to pursue shape conditions of visibility in the park?"

These questions probe our assumptions about the malleability of our information-sharing practices and of our material, built surroundings, both, assuming that each has the power to shape the other. When people say that social software, surveillance cameras, and other digital technologies have diminished our desire for and expectations of privacy, I fear that they are ascribing potentially limitless liberties to the built environment while paying grossly insufficient attention to the normative, or moral sway of our entrenched practices. I have suggested that while these practices are responsive to material changes, including the technological, values are also a consideration limiting human action; some are general moral and political values, such as justice, freedom, and autonomy, while others are context-specific.[lxiv]

Let us return to the domestic dwelling, a space most consider quintessentially private. Normally, the people entering our homes are its residents, typically family members. In addition, there are those we invite inside, including extended family, friends, and acquaintances. Of these visitors we have expectations regarding how they will behave—whether they will open our bathroom cabinets, peek into the refrigerator, and so forth, and how they will share with others whatever they have seen or hear whilst inside. Being invited in to someone's home is at least weakly constitutive of friendship, and visiting with friends in their homes serves to strengthen and deepen friendship in both symbolic and practical ways; we have opened our homes and lives to others, and distinguished our relationship to them, through friendship. Naturally, there is great variation in these rituals and practices within our societies and, probably

more so, across different cultures and nations, some stemming from history and tradition, others from brute constraints such as the size of houses and the availability of common meeting spaces outside of the home.

In other words, whether by design or serendipity, opaque walls, by mediating and limiting exposure to information flows comprised of sensory data, provide a currency for expressing friendship, for example, and differentiating it as something special. No doubt a similar story of the interplay between architecture and social practice could be told about other sites, whether open spaces, public squares and streets, or sidewalks—the ways that built properties both exclude and enable access to us and in so doing contribute to the definition of persistent social roles and relationships. In a world with glass houses, however, seeing into the home of another person is less distinctive as marker of friendship; casual passers-by, or browsers of GoogleMaps Street View who happen to be perusing your neighborhood, may gain at least a visual access through these other mediations. Should we allow, or even invite these changes, simply assuming that our activities, attitudes and sentiments will meld to their novel combination of material and social requirements?[lxv]

KV Our society seems to be built out of contradictions. Our walls appear ever more transparent even as corporations and the government seem ever more closed to us. There is no question that technology has played a role in this; but here again, we need to think of the situation beyond technology. Our age is really a network culture. Technology is not something merely for nerds or engineers—it permeates our lives, and our desires (and the desires of those who would like to control our desires) also shape technology.[lxvi]

Take the glass house, for example. Back in 1949, architect Philip Johnson built one for himself in Connecticut, while in 1951 Ludwig Mies van der Rohe built one for his client Edith Farnsworth in Illinois.[lxvii] In the case of the second house, Farnsworth—a lover of Mies's who broke up with him during the construction of the house—complained bitterly and publicly that the house put her on display, like a caged animal. Still, she stayed on for two decades afterwards, unwilling to leave. In contrast, Johnson delighted in putting his life on display in his Glass House, although in fairness he also had a brick house built on the site that had only three porthole windows.

Under network culture—and by this epithet I mean the cultural condition of the last decade and a half, since the expiration of postmodernity—we have become much more comfortable with self-exposure. According to a recent survey, one in four Americans has had a photo or video taken of them while they were nude.[lxviii] The artist, theorist, and performer Jordan Crandall has written about this phenomenon as "a new culture of erotic exposure and display...[a culture] of *showing* as much as *watching*..."[lxix] Reality television, amateur porn sites, and social networks make a life on display—either to one's friends or the entire world—alluring to increasing numbers of people. And showing is also demanded of us. Take university professors like ourselves: for years, academics were considered Volvo-driving (I admit to owning two Volvos) misanthropes who wore corduroy jackets with patches on the sleeves and got $10 haircuts. Now Ratemyprofessor.com has students vote on the basis of our hotness.[lxx] Better go to the gym and remember to get my Prada out next time I'm heading to school! There's a demand for performance and display, even eroticized display, in society today, a demand that grates against older ideas of privacy.

Architecturally, there are corollaries as well. In New York, there has been a burst in the construction of highly transparent apartment buildings and hotels, and with them, a spate of exposure and voyeurism. Take the Standard Hotel, which straddles the High Line (a deliberate architectural metaphor) and places freestanding bathtubs in front of floor-to-ceiling windows. Although there are curtains, the hotel is playing a game, tempting visitors to leave the curtains open so as to simultaneously enjoy the view and show off their bodies. The Web site for the hotel even boasts a live webcam of the exterior! So there's little surprise that people walking along the High Line have a good chance of seeing some naughtiness. Could you imagine that happening in the 1950s or even the 1980s? Back in 2007, Penelope Green, writing for *The New York Times,* observed that the transparency of the new architecture was linked to the online culture of exposing one's personal identity on Facebook and YouTube. This is the logic of showing that Crandall identifies, the private thrill of voyeurism inverted to a public thrill of self-exposure.[lxxi] Though again, people do have a choice here. It's not like you have to stay at the Standard and, as Michael Wolf's photograph of Ludwig Mies van der Rohe's 860-880 Lake Shore Drive shows, glass skyscraper apartment buildings, completed in 1951 shows, exposure and privacy are a complex dance.[lxxii]

Michael Wolf, *The Transparent City, TC87a* (2008).

Cultural mores, of course, evolve over time, and this trend of voyeurism is part of a greater degree of informality and acceptance of sexuality, particularly forms of sexuality once considered deviant. I don't feel like it's my place to condemn such practices, but what to do with this condition? We can lecture people all we want about the dangers of posting nude photos, but just as it became acceptable for presidents to have done drugs, such photos will likely be acceptable one day too (after all, nobody in France seems to complain about the nude photos of French First Lady Carla Bruni).

I think we're in the midst of an epochal change of subjectivity, and formerly strong boundaries are dissolving. Lamenting this change seems like a mistake to me. But what to do? How can we safeguard ourselves against being exploited?[lxxiii]

HFN Glass houses have not really caught on, and Jennifer Ringley, who in 1996 created JenniCAM, ceased its operation in 2003.[lxxiv] I'll admit, however, that these arcs do not disprove your hunch that we are in the midst of epochal change; but the co-evolution of technological systems, on the one hand, and desires and cultural mores governing such things as nudity or the use of recreational drugs, on the other, by themselves do not carry the point. I am, however, worried by the suggestion that all values and behavioral norms are vulnerable to the shaping forces of architectures (digital and physical.) The claim that industry leaders create "neat" technologies, and these set in motion epochal shifts in matters such as subjectivity and private/public boundaries—for example, Mark Zuckerberg asserting that Facebook simultaneously causes and reflects changing privacy mores—sets my teeth on edge because so often it thinly veils self-interest.[lxxv] In contrast, a similar claim about the power of leading fashion designers to shape people's tastes in clothing seems quite plausible. I would like to think that while certain cultural values and mores are vulnerable to change, and that such change can be normalized, other values and norms are resilient. These values may not be invincible but, if threatened by a system that may not be avoidable (for example airport body scanners), people will rally to save them with protest or workarounds.[lxxvi]

Glass houses and public webcams are relatively easy to dismiss; we have managed to say (thus far) "thanks, but no thanks."[lxxvii] The transparency we seem to be inviting into our lives is less a function of glass than of the networked objects we have accommodated in our dwellings, on the roads, in public gathering places, and so forth. With GPS, facial recognition enabled photography, EZ Pass, QR codes, carded entryways, DVRs instead of DVDs, and cell phones, we need no longer go online to be identified and tracked—we are bringing networks into our lives. We are defying the "natural" protections afforded our physical surroundings.[lxxviii] We have opened informational peepholes where solid walls existed. Where blinds and window drapes provide discretion over the visual access others may have, access via these peepholes is a matter of great complexity, mostly not well understood by the majority of these technologies' users. On open roadways, we no longer can assert entirely free motion but are tethered (have tethered ourselves, in may cases) in our use of GPS devices, EZ Pass, and mobile phones.[lxxix]

This transparency is nothing new, some may say. Telephones pierced the walls of our home and networked us; so did power grids, radios, and driveways connecting to public roads, waterworks and even public sewage systems.[lxxx] The digital networks of today, though not necessarily new as networks *per se,* are new in their capacities to enrich (or augment) everything else with data and metadata. The power grid networks us; the smart grid opens the informational floodgates. Although we are relatively astute in identifying disruptions of exposure and access due to such technical interventions as glass houses and airport body scanners, I fear that we may not fully appreciate the nature of the threats posed by ubiquitous informational overlays, from smart grids to intelligent vehicle safety systems, to FourSquare. Sometimes, we simply make mistakes evaluating technologies, not immediately realizing their implications for our deeply held values.[lxxxi]

People have flocked to social networks. At first, these users engaged with gay abandon but, more recently, realizing some of the threats, with greater caution.[lxxxii] Nevertheless, we continue to list our friends and acquaintances and share information, photos, and experiences with them; we post comments on blogs, ads on Craigslist and pose for photos with our buddies. Taking advantage of this, a Santa Barbara based company, *Social Intelligence,* uses what it can scrape from social media to produce dossiers for companies on job applicants.[lxxxiii] According to its CEO, the company adheres to a strict code of conduct in order to steer clear of federal employment anti-discrimination laws; success stories of which he boasts include applicants not hired over

sexually provocative photos, posing with weapons, and posting racist comments.[lxxxiv] I do not want to dwell on whether and why this company's business might be harmful and unfair to applicants, although it is important. Instead, I want to consider what might be the impact of *Social Intelligence,* and companies like it, on our networked lives in the terms of our discussion, thus far. One possibility is that we simply will get used to the increased exposure, to the enlargement of "the public" in networked spaces. We will adapt; we will get on with our social lives as before, continue engaging with our friends, "friends," and indirectly with the likes of *Social Intelligence.* A different, and to me more troubling possibility, is that we will adapt by becoming more cautious in what we post, share, and say online; as long as our livelihoods might be placed in jeopardy by companies like *Social Intelligence,* our caution will extend even to communications with friends and family.

We will become more circumspect because the medium does not protect the expectations we have regarding information we share with close acquaintances. In acting rationally to protect ourselves against harms (e.g. job loss), we shrink the opportunities to develop and nourish friendship itself. Certain cultural mores may radically change with the informatization of our networked lives. Just as, we may become inured to naughtiness seen from and exposed to the High Line, so may we generally become accustomed to altered standards of modesty. We may adapt to the risks of unconcerned disclosure by exercising greater caution, but will we adapt to a shrinking of the sphere of friendship? I like to think not. I like to think we will be ready to see these trajectories as errors and look for ways to correct them with protest, policy, or redesign.

Veering back to your remarks on the toll complexity takes on people and societies, one additional toll comes to mind. In the case of our job applicant who loses an employment opportunity because a background check of social media reveals a photograph of him standing beside a marijuana plant, we may cry "foul!" We may violently disagree with the decision but at least we understand the pairing of cause with effect. With the advent of actuarial prediction based on data aggregation, mining, and profiling, however, decisions are made that we do not understand; even those making the decisions may not understand the decisions being made because the highly complex algorithms whose outputs are statistically significant correlations defy the ordinary theories that have guided our actions in the past. The applicant for work in a

hospital who does not get the job because of a nude photo on the Web finds it unfair, but the applicant who is denied credit because he does not purchase premium bird feed or shops at Walmart is well and truly stumped. Although I have heard the justifications for evidence-based decision making, a world in which we do not understand the cause-effect relationship of our actions to outcomes diminishes a sense of control, that is, autonomy, or self-determination that any democratic society should guarantee to its members.[lxxxv]

KV I'm afraid that this lack of clarity is precisely what we're facing these days. Information technology is but one human artifact that grows in complexity every day. It's one thing to face injustice and be able to identify the accuser; it's another to have no sense of why the injustice is taking place. Agency dissolves into the ether. We wind up like the narrator, K., in Kafka's *The Castle.*

The archaeologist Tainter points to an equally scary alternative, which is the rapid decrease of complexity that occurs when civilizations collapse. I think we're at a very real danger of this outcome. The sort of political stalemate that led to the August 2011 crisis in the US Congress and the current Eurozone crisis is evidence of the problems of societal complexity: we can't make decisions anymore, the structures we have created are too ossified to let us do that. Technology doesn't make this situation any better.

On the contrary, technology brings us nearer to the breaking point. Take the iPhone. It may be heralded for its simple interface, but many iPhone owners complain that it fails to connect and drops calls constantly. Or take the simplicity of iTunes purchases. iTunes decided to bill me with 90 erroneous charges the other day and a representative only apologizes for doing so only two weeks later. In spite of that, I still own an iPhone and even Apple stock. The alternatives are worse so the iPhone thrives, but often it seems to me that our society is held together with spit and glue.

As far as recalibrating ourselves to protect our identities online, I'm not so sure. It may happen—Google Plus is a step in that direction.[lxxxvi] As for Mark Zuckerberg steering the direction of social mores, I find that laughable. The notion of "neat technologies" determining the course of social change runs 180° counter to my way of thinking about

network culture.[lxxxvii] Technologies that appear to be driving society are merely the ones that are in the right place at the right time: they may make things easier, but they do so within a context for which they are suited. Take videophones and video chat. AT&T demonstrated its Picture Phone at the New York World's fair in 1964 but people didn't exactly clamor for it. The demand wasn't there. Even now, the number of adopters is limited.[lxxxviii] Curiously, Facebook offered little that was technologically new when the site came online, except for the elite nature of its exclusivity and better spam management. Zuckerberg and Facebook have done virtually nothing since then. He got lucky. If he gets lucky again—and I think Facebook will likely be shuttered in a decade—it will only be because one of the tremendous investments of time, money, and effort that Facebook can now afford to make pays off.

Rather than technology being the sole driver in the dissipation of the self, it's really a societal trend. We've become much more informal with regard to personal conduct over the years; technology is facilitating that but not driving it. Jennifer Ringley may have shut down JenniCAM, but the anonymous image board 4chan sprouted in its place.[lxxxix] Growing informality will mean the loss of further social mores, some of which we may want to maintain. It reminds me of a friend who was thinking of applying to the CIA to work as an agent in the 1980s. As they explained to her, they didn't care how many hard drugs she'd done and or how many sexual relationships she'd had as long as she admitted it all to them. None of that mattered as long as she was willing to be transparent. If she hid things, then it would be a problem. Silvio Berlusconi is another example: his behavior is unconscionable but since he (largely) dismisses it as normal, he got away with it (mind you, it doesn't hurt that he controls much of the media in Italy).[xc]

This kind of informality goes hand in hand with the transition from enclosures to modulations. With e-mail and smart phones we're always on call, either from our family, our work, or the other institutions (creditors, insurance companies, banks, police, doctors etc.) that wish to claim authority over us. The best way to explain this shift is to think of a worker in a factory in the 1950s. No matter how mind-numbing their job, once they punched out at five o'clock, they were free until the next morning. Today they are in demand around the clock. In turn, the workplace becomes a place both of education (on-the-job training) and pseudo-fun (weekend "retreats" couched in terms of group self-

realization, team-building games, and so on); but this enforced camaraderie only serves to make the experience that much more Kafkaesque.

Deleuze suggests that as we shift from a disciplinary society of enclosures to a control society of modulations, we shift in our idea of what a subject is. Instead of seeing us as clearly defined individuals, corporations see us as dividuals, as assemblages of cultural flows. In turn, psychologist Kenneth Gergen suggests that we have internalized this condition as well.[xci] In other words, rather than understanding ourselves as whole subjects with a clear sense of identity, we see ourselves as a series of often conflicting flows (one person becomes an ultra marathon runner, scotch connoisseur, high school teacher, parent, straight but queer, displaced Floridian, desert rat on weekends, half-Thai, etc.). If this shift seems radical, we have to remember that the modern subject as we knew it was only constituted discursively in the eighteenth century, so there's no reason we should have expected it, either, to last forever.[xcii]

Yet our legal system still seems based on earlier notions of defined spaces and defined selves.

The modern notion of privacy went hand in hand with the emergence of the modern subject.[xciii] As places of work and places of life separated, we began to make divisions in our minds about work life and home life. With this change too came new divisions within families, such as the end of communal bedrooms.[xciv] Imagine going back to the old ways of life, in which generations slept—and had sex—in the same room! Obviously that scenario is not going to happen, but what I want to suggest is that architecture and subjectivity are intimately linked. Finally, there's the role of the media in all this. Literary critic and Stanford professor Ian Watt and others observe that the novel did much to define the modern idea of subjectivity as well, creating a clear sense of an internal dialogue that was separate from the outside world.[xcv] All these things go together. Our notions of space, self, public, and private are being radically redefined today.

How do we overcome that redefinition? And do we want to?

HFN It is fascinating for me to discover the common touchstones of our different intellectual traditions! Your comments on the stresses of navigating constantly shifting boundaries reminded

me of an article by MIT professor Wanda Orlikowski and Stanford professor of Management Stephen Barley urging researchers in the fields of IT management and organizational studies to heed each others' approaches. Their central claim is not directly interesting to us here but the case of telecommuting, which they use to illustrate it, is. Considered separately, research results from IT management on the one hand, and organizational studies on the other, suggest that the impact of telecommuting on the workplace has been relatively minor. Yet the picture that results when one merges results from these two disciplines reveals quite a different story:

". . . even though institutions militate against substituting office work with home work, existing cultural norms are consistent with using the infrastructure to increase the number of hours that employees work and, in many cases, to appropriate the use of the employee's home at little cos. . . . organizational scholars have failed to recognize the role that networked computers may play in breaking down the separation of work and home, long the hallmark of social relations under industrial capitalism."[xcvi]

In other words, results from empirical research suggest that while the workplace itself has been little altered, the lives of workers has been radically affected by the interpolation of work life into home life.[xcvii] This phenomenon is a robust experience for many of us living and working in the more developed countries, and it's heartening that it can simultaneously be theorized by intellectuals from critical, continental schools of thought and also modeled and measured by those in the analytic tradition.

There is much to say, and much has been said, about this altered state of social life and attendant alterations in subjectivity. Particularly fascinating to me is how subjectivity may be affected by its relationship with architecture! I want to be more careful, however, about what this shift implies for privacy: in fact, our discussion has helped me to understand, in a new light, the trajectory of my own thinking. When I first observed that people have a right to *privacy in public,* it was because of a phenomenon I called *public surveillance,* that is, the capture and aggregation of information about us in so-called public places. Public surveillance was facilitated by numerous systems we have already mentioned, such as CCTV, camera and mobile phones, credit card purchases, frequent buyer clubs, etc. These observations led me to a position that I

have held and argued ever since: i) the dichotomy of public and private, useful as it may be for social, legal, and political analysis generally, does us no good in understanding individual privacy; further, ii) insofar as the conception of social life comprising differentiated spheres is useful for understanding privacy, spatial boundaries alone do not mark these spheres. Instead of a dichotomy of public-private, I suggested the abstraction of social contexts, differentiated according to characteristic roles, activities and practices, purposes, values, norms, and possibly other dimensions as well. Institutions, such as schools, marriage, corporations, or churches may structure contexts, such as education, family, the marketplace, and religious observance, respectively, but do not constitute them. Within a particular context, informational norms prescribing the flow of personal information from one party to another, define in general who may send information about whom to whom, what type of information, and the conditions under which information may flow. Privacy is a function of these norms, and in particular maps onto contextual integrity, which is transgressed when actions or practices breach informational norms.[xcviii]

The boundary shifts you mention, such as work calls on weekends or staff retreats at holiday resorts, throw us off-balance because we can no longer count on physical borders—the factory walls—to separate different spheres of life. Conceptions of privacy that are based on physically demarcated boundaries are, indeed, seriously challenged by the vulnerability of space to penetration by information systems, digital media or other means. Because many prominent legal, policy, and philosophical approaches to privacy have such conceptions of demarcated boundaries of public and private at their core, I can understand why they may lead us to conclude that privacy itself needs to be radically redefined in the face of an Internet of Things and the information-enriched, augmented reality of the networked, geospatial environment.[xcix]

Contextual integrity has no problem with shifting spatial boundaries. Because someone or something from one sphere can now be interjected into another—say, a friend calling you as you ride home from work on crowded public transit—does not, in that moment, homogenize the relationships of "friend" and "fellow commuter" simply because we are sharing space/time with both. Similarly (circling back to points we discussed earlier) it is preposterous for the likes of Foursquare, Apple,

WHEN YOU POST USER CONTENT TO THE SITE YOU AUTHORIZE AND DIRECT US TO MAKE SUCH COPIES THEREOF AS WE DEEM NECESSARY IN ORDER TO FACILITATE THE POSTING AND STORAGE OF THE USER CONTENT ON THE SITE. BY POSTING USER CONTENT TO ANY PART OF THE SITE YOU AUTOMATICALLY GRANT AND YOU REPRESENT AND WARRANT THAT YOU HAVE THE RIGHT TO GRANT TO THE COMPANY AN IRREVOCABLE PERPETUAL NONEXCLUSIVE TRANSFERABLE FULLY PAID WORLDWIDE LICENSE (WITH THE RIGHT TO SUBLICENSE) TO USE COPY PUBLICLY PERFORM PUBLICLY DISPLAY REFORMAT TRANSLATE EXCERPT (IN WHOLE OR IN PART) AND DISTRIBUTE SUCH USER CONTENT FOR ANY PURPOSE ON OR IN CONNECTION WITH THE SITE OR THE PROMOTION THEREOF TO PREPARE DERIVATIVE WORKS OF OR INCORPORATE INTO OTHER WORKS SUCH USER CONTENT AND TO GRANT AND AUTHORIZE SUBLICENSES OF THE FOREGOING. YOU MAY REMOVE YOUR USER CONTENT FROM THE SITE AT ANY TIME IF YOU CHOOSE TO REMOVE YOUR USER CONTENT THE LICENSE GRANTED ABOVE WILL AUTOMATICALLY EXPIRE HOWEVER YOU ACKNOWLEDGE THAT THE COMPANY MAY RETAIN ARCHIVED COPIES OF YOUR USER CONTENT.

Burak Arikan, *Facebook Terms & Conditions* (2007).

or IMS Health to lay the same moral claim on the information that flows through their system as the friends with whom we are intending to communicate or the physicians who prescribe medication for us. We dare not allow technological affordances to define our expectations without seriously compromising the purposes and values of distinct social contexts—home and social life, work, health care, political citizenship, and so forth.

KV I appreciate that you have thought out a system that parallels the modulations of control society with a contextual approach to ensure our privacy. But what about recommendations from retailers like Amazon and Apple's iTunes? Most of us appreciate the little suggestions they make: based on this purchase, other people bought *this* or we thought you might like *this*. It's certainly better than the clueless salesperson at the mall. Where do we draw the line as to what information is legitimate to use?

This question brings me back to my earlier concern. Clearly, a system of contextual rights to privacy makes sense. How do we create a system that doesn't add massive levels of complexity? It strikes me that this could result in more complexity and ever more impossible amounts of information to process, particularly in terms of service agreements, which artist Burak Arikan foregrounds for us in his 2007 work "Terms & Conditions." Or worse yet, such a system could just lead to other forms of trouble. Take a recent incident at Google.

A number of young people under the age of thirteen were sent invitations to their Gmail accounts to join the Google Plus social networking platform by family and friends. When they gave their age, Google locked them out of not only Google Plus but out of their e-mail accounts because the Children's Online Privacy Protection Act of 1998 put restrictions on what sort of information corporations can gather about individuals under the age of thirteen.[ci] Now, to be fair, Google simply needed to rescript Gmail to not gather that information and, in an effort to deal with a growing problem, they may yet do so, but it strikes me that their response was simply an attempt to throw their hands in the air in an overly complex situation.

Is there some way to address the problems of growing complexity while creating a contextual privacy policy?

HFN The first layer of contextual analysis, for the most part, has a descriptive intention, offering a sharper lens with which to view socio-technical systems that disrupt entrenched information flows. It offers a systematic way of evaluating the claim, "Nothing has changed: what's the problem?" that one often hears from proponents of newly deployed systems in anticipation of protest. In defending Google Maps Street View, for example, supporters might say, "Nothing has changed. This is a public street; any passer-by can view it." These claims fail to note all the different ways things may change when we interject new systems into the context of the public street—in the case of Street View, for example, networked video feed. Yet both of your questions take us beyond this merely descriptive stance because they do not challenge whether or not change has occurred but whether or not this change is acceptable, desirable, or beneficial. It would be problematic for contextual integrity if it implied that all change was bad and must be resisted.

It would be problematic, in the name of privacy, to resist useful recommendation services such as those you mention, for example, offered by Amazon and iTunes. I would be hard pressed, in general, to defend a conception of privacy that rules out any and all alternations in information flows, even clearly beneficial ones. The second, normative layer of contextual integrity tries in earnest to provide a framework for distinguishing between disruptions in flow we should resist (in the name of privacy) from those we should accept, or even embrace. I have suggested that this evaluation must take place against the values and purposes of surrounding contexts. Designed and deployed carefully, recommender systems are not unlike the practices of a good medical diagnostician, who gathers lots of information about patients' conditions and lifestyles, categorizes them, and then recommends relevant actions. We don't begrudge the competent medical diagnostician any information, however intimate, personal, or sensitive because we understand these assessments are applied in the interest of promoting good health, a key purpose of the healthcare context.

Mapping patterns of information flow onto values and purposes is painstaking work, involving a grasp of relevant facts about a context and often entailing taking a stance on controversial questions. Members of a society might agree on some of the basic values and goals of contexts such as healthcare, education (and intellectual development), and the commercial marketplace, but not on all. For example, should healthcare favor public health over individual health, prevention over treatment; should education merely develop the intellect or train for employment and citizenship; should the commercial marketplace follow ethical principles or guidelines of a competitive free market?

Informational norms that we deem "good" will ideally drive design and deployment of systems large and small, from the Internet of Things to Amazon's recommender algorithms—and not vice versa! Over and over, we must remind ourselves (and those who design and deploy these systems) that design is malleable and how we design can affect information flows, determining who sends information to whom, about whom, what information, and under what conditions. Because we do not all have the same direct interests at stake, we should strive for transparency, particularly for systems that affect people's well-being and life prospects, as we would for the political systems according to which we are governed. (In drawing a parallel between values embodied in the structure of political systems and values embodied in technical systems, I follow Science, Technology, and Society scholars, such as Bryan Pfaffenberger and Langdon Winner.) I can agree only partially with the suggestion you made earlier that technical systems do not have independent causal powers but reflect cultural ideals that are already in the air, conveying intentions that are already seeded in social and political life. Because there is never unanimity of public opinion, and technical systems have power to amplify some outcomes over others, it is well worth attending to this discretion in design.[civ]

Skeptics may challenge this directive regarding the care needed to identify values in design, pointing to technology's unintended consequences (for instance, pollution from motor vehicle emissions) or its emergent properties (such as email, the "killer app" of the Internet)—neither of which was conceived or designed into respective systems by their creators. These obviously powerful cases could lead designers to shrug off all responsibility, or, my preferred inference, could reinforce our grasp of how material artifacts and social outcomes are intricately related, with the intentions and practices of design one key factor among several.[cv]

Like you, I have also been concerned by the impossible complexity of popular online consent strategies, such as terms of service and privacy

policies, and particularly by the sustained pretense that people are actually making decisions when they click "yes." The approach recommended by contextual integrity suggests something different. Norms that operate in everyday social life, from the serious to the superficial, can serve to lighten the burden of complexity. We can see this at work in simple conventions such as how to eat with knife and fork, the polite way to walk through doorways, how to answer a telephone, what side of the road to drive on, and so forth. Imagine how impossible life would be if we had to weigh all the possible factors each time we engaged in these activities and practices! Norms that have evolved over time to serve general ethical values, context-specific values, and even simply smooth social interactions, lighten the burden on us, presumably giving us time and space to deliberate over decisions that are more difficult, subtle, and contentious.

Terms of service, on the other hand, force us to weigh factors each time we act—visit a website, purchase from an online merchant, conduct a financial transaction, use a web 2.0 social network, and so forth. Because the burden of this expectation is too great, we tend to go with the default setting and blame our own indolence for what disadvantages this choice might bring. Being able to count on norm-governed regularities relieves some of this burden and builds on the wisdom of the ages. In case this position sets some readers' teeth on edge, I must quickly add that entrenched practices may always be challenged, by people, things, events, and, yes, technologies; new avenues are opened, old avenues are shut. At these times, we need to confront all the complexity that norms may have hidden as we revisit entrenched practices and evaluate them in light of new possibilities. Digital information technologies and their integration into physical space constitute one such conceptual challenge, earning, as this problem has, our regard, fascination, and concern.

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ACKNOWLEDGMENTS

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Christian Nold and Rob van Kranenburg

Christian Nold and Rob van Kranenburg articulate the foundations of a future manifesto for an Internet of Things in the public interest. Nold and Kranenburg propose tangible design interventions that challenge an internet dominated by commercial tools and systems, emphasizing that people from all walks of life have to be at the table when we talk about alternate possibilities for ubiquitous computing. Through horizontally scaling grass roots efforts along with establishing social standards for governments and companies to allow cooperation, Nold and Kranenberg argue for transforming the Internet of Things into an Internet of People.

THE ARCHI
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