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Culture of the Cloud

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Abstract

The goal of this speculative essay is to ask after potential consequences of the emerging notion of “cloud computing” not only for virtual worlds, but also for human sociality in general. I explore the short history of cloud computing and some presuppositions that shape construals of “cloud computing” and its consequences. I examine convergences and distinctions between cloud computing and virtual worlds, and what this tells us about new forms of computer-mediated culture.

Keywords: cloud computing, virtual worlds, social networks

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Culture of the Cloud

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Stage 1: Evaporation

The goal of this speculative essay is to ask after potential consequences of the emerging notion of “cloud computing” for virtual worlds, but also for human sociality more generally. The essay has four parts or “stages.” Taking its metaphorical engagements as points of analytical departure, the four parts of this essay will follow four stages of the cloud cycle. Given that a cycle has no beginning or end, we can start anywhere and so might as well begin with “evaporation,” the upward movement of water vapor — or in this case, the posing of questions for inquiry. Following this short introduction, in the second part of the essay I briefly sketch out the history and current usages of the phrase “cloud computing.” Third, I look at the presuppositions that shape construals of “cloud computing” and its consequences. Fourth, I examine convergences and distinctions between cloud computing and virtual worlds, and what this tells us about new forms of computer-mediated culture.

I am interested both in positive possibilities of cloud culture for translocal connection and citizen empowerment, and also in negative possibilities of cloud culture for centralization and alienation. In my work on virtual worlds, I have been at pains to emphasize the key importance of grasping social phenomena “in themselves,” as they are understood in everyday life, and at the same time exploring the forms of interconnection between social phenomena (Boellstorff 2008). For instance, it would be a mistake to see a networked society as network and nothing more, a placeless web of intersecting lines. Yet interconnection can take a range of forms, including the movement of bodies, commodities, and ideas, but also forms of stasis and non-movement—forms of overlapping and obviation (Wagner 1989). Cultures of the cloud may provide both conceptual resources and experiential paradigms for rethinking the constitution of social phenomena through place and connection.ⁱ

Stage 2: Condensation

Evaporation is followed by “condensation,” the formation of clouds from water vapor. It is hard to determine when cloud computing first condensed: the concept is quite new, and clear definitions are as difficult to grasp as a cloud itself. Wikipedia, which in a case like this is the closest thing to an authoritative voice, notes that John McCarthy, the computer scientist who coined the term “artificial intelligence,” spoke as early as 1960 of the possibility that “computation may someday be organized as a public utility,” and also that by the 1990s, the term “telecom cloud” was used in reference to some data communication protocols.ⁱⁱ However, it is clear that “cloud computing” as currently understood is of much more recent provenance. It is telling, after all, that the First International Conference on Cloud Computing took place only in 2008, and another international conference on cloud computing met for the first time in December 2009.ⁱⁱⁱ

At its core, “cloud computing” refers to providing a range of computer resources over the Internet. For instance, rather than purchase a word processing program and install it on a desktop

or laptop computer, a user accesses a word processing program online (Google Docs is a well-known example of this).^{iv} Or, rather than backing up files on a local hard drive, a user uploads files onto an online server and stores them there; in many cases, like that of Flickr for images, the data can optionally be available to multiple persons, or even be open access for everyone.^v Google's Chrome operating system is just one example of an initiative to take this tendency to its logical conclusion: the locating of all aspects of computing, even operating systems, online.^{vi} In cases like these, the physical location of the computers providing the processing or storage services in question are not known to the user: it is not considered relevant information, and their physical location might float elsewhere over time. The computing in question is understood to take place in what at first glance appears to be the abstracted and generalized non-place of "the cloud."

The essence of cloud computing, then, is a de-emphasis of the desktop or laptop computer via an online engagement with computing resources. Cloud computing is, therefore, at its core a kind of intensification or condensation of Internet mediation. This is the pivotal difference between cloud computing and the related but distinct notion of ubiquitous computing, which typically refers to the embedding of computational capabilities in everyday objects, from cars to shoes. The key issue in cloud computing is that it is no longer just data that is transferred via online technologies; computation itself becomes Internet-mediated. That is why the true technological predicate for cloud computing is not processor speed or disk size, but the ability to transmit large amounts of data cheaply and wirelessly online. The reason why "The Battle Over Cloud Computing" appears as a cover story in *The Economist* magazine on October 17, 2009, (not 2005, 1999 or 1989) has to do, above all, with thresholds of broadband access.^{vii}

In the 1980s, we witnessed what arguably was the most significant development in computer history: the invention and mass-market adoption of the personal computer in desktop and then also laptop forms. The era prior to this, the first age of modern computing, was the age of the mainframe. Mainframes were centralized computer behemoths looked after by technical specialists. Users did not have computers but "terminals," a word that has largely fallen out of use, from which they accessed shared computing resources. Mainframe computers certainly still exist, but with the rise of the personal computer, computation and data storage could leave the mainframe environment and take place at the desk of the individual user. Programs were duplicated millions of times and installed on individual computers. The need to install such programs, and also to move data between personal computers, led to a whole range of transfer technologies, including floppy disks, zip drives, CD-ROM and DVD disks, and flash drives. When Internet access first became available for personal computers, the limits of dialup technology meant that online communication was used mostly for email, website access, and the transfer of relatively small document files. The rise of broadband and also wireless Internet access has led to the decline of these data transfer technologies and the possibility of cloud computing.

The fluffy image of the cloud obscures how cloud computing represents nothing less than the end of the second age of computing, the age of the personal computer, and a return to the mainframe in a virtual form—"virtual" in a general sense, but also in the specific sense that it is accessed via the Internet. Since the mid-2000s, we have seen the emergence of "netbooks": small, inexpensive laptop computers with limited processor and storage capabilities, designed primarily for cloud computing. Additionally, we have seen the continuing acceleration of a shift from basic cellphones to "smartphones" like the iPhone that are also designed for cloud computing. In other words, netbooks and smartphones both function largely as wireless terminals

for accessing the virtual mainframe called “cloud computing.” One thing condensing from cloud computing, then, is a depersonalization or re-terminalization of the computer, and I cannot imagine that this will not have significant consequences for human sociality.

Stage 3: Precipitation

In the cloud cycle, condensation is followed by “precipitation,” the formation of rain or snow. It is not yet clear what will precipitate from cloud computing, but if the history of computing and technology teaches us anything, it is that what at first glance appear to be obscure protocols and technical debates are in fact social practices with significant cultural consequences (see, e.g., Kelty 2008). With regard to cloud computing, we are at a stage where the phenomenon in question is highly emergent and the tools for inquiry are not yet clear. At times like these, I find it useful to return to my roots as a linguist and begin with the metaphorical entailments of the phenomenon in question. Indeed, I have formulated this entire essay with such an approach in mind.

Therefore, what precipitates from “cloud” computing? Consider clouds for a moment. When it comes to cloud computing, the images that appear everywhere from the cover of *The Economist* to the logo for the International Conference on Cloud Computing show clouds that are white and fluffy. No thunderheads or hurricanes, no dark clouds on the horizon, not even any fog. What is invoked is what, following the classic work of Eleanor Rosch, we could term a prototypical cloud (Rosch 1973). In this understanding, clouds never depart into the stratosphere or touch the ground. They are liminal between earth and sky. They do not have intentionality but are mobile, moving laterally and collectively as a consequence of impersonal meteorological forces. No one owns a cloud or controls its movements. Clouds are features of a landscape to which humans must adapt. They persist yet are ephemeral, constantly changing shape. You cannot stand on them or touch them, yet they cast shadows and can precipitate rain or snow. They are sometimes presented as heavenly, the place where God lives or those who have died now reside.

The overall image that emerges from this prototypical construal of the cloud obscures both agency and place. The cloud is an ostensible non-place, separate from the earth, insubstantial and inaccessible. It is a naturalization of the social just as much as using biogenetic metaphors of “hybridity” to talk about diaspora, or using hydraulic metaphors of “flows” to talk about globalization. “Naturalizing power” in this manner is a longstanding strategy of domination and control (Yanagisako and Delaney, 1995).

Stage 4: Infiltration

In the water cycle of cloud formation, “precipitation” is followed by “infiltration,” or the movement of rain and snow into subsurface soil and rock. How will the notion and experience of cloud computing infiltrate everyday subjectivity and sociality? At this point, the best we can do is set out questions and provocations that can hopefully serve as starting points for future research. As a metaphor, a set of technical protocols and design specifications, and an emerging configuration of social practices, the culture of the cloud may represent nothing less than a successor principle to that of the “network.” In a network, you make links between nodes, lines that make up a net, but in a cloud you “tag,” as the convergent metaphor of a “tag cloud” indicates. “Tag cloud” might seem to be a different idea than “cloud computing,” but they have

arisen together and share a set of entailments. A tag does not draw a line between two nodes in a network; it names affinities. It does not connect; it clumps. A tag cloud shows terms in a kind of assemblage; not a network but an aggregation. Frequently used tags usually appear larger and in a darker color in a tag cloud, as if they threaten to precipitate from it. Tagging seems to be a salient element of the culture of the cloud, because it allows for connection without the notion of the network. It may be, for instance, that while Facebook and Twitter are currently described as examples of “social networking sites,” in fact they and other such phenomena represent not networks but cloud cultures where techniques like hash marks allow participants to tag each other without networking as such, so that you socialize in a cloud of friendships and affiliations. The culture of the cloud is “infiltrating” the network society.

I am particularly fascinated by possible consequences of cloud culture for notions of the real, which I prefer to term the “actual,” and the virtual. Moving between earth and sky without touching either, clouds slide laterally in a liminal space, a space of tagging rather than mediation. This space straddles actual and virtual; it is a kind of in-between space that is emerging as a crucial site for sociality. However, one crucial thing obscured by the cloud metaphor is that the epochal shift to cloud computing implies leaving the personal computer behind: it represents an epochal depersonalization of computing, a powerful recentralization not just of computer processing and data storage, but ownership and control. The image of innocently ephemeral clouds disavows this centralization of control; the metaphor must be reworked to enable interventions into issues of privacy, corporate power, and access. We may need to respond critically to the gathering storm and seed some clouds of our own; perhaps new clear-sky initiatives are needed, or better forecasting.

Cloud computing is a broad socio-technical formation, relevant to many domains of human experience—certainly including virtual worlds. At first glance, virtual worlds and cloud computing might seem utterly opposed, since the key defining feature of virtual worlds is that they are places and a key defining feature of cloud computing seems to be a status of non-placeness. However, it is not coincidental that virtual worlds and cloud computing both emerged in the early-to-mid 2000s. It is not just that virtual worlds and cloud computing both require broadband. For virtual worlds to be persistent places, they must continue to exist even as individual residents switch their computers off. They must be stored in and instantiated thorough a kind of virtual mainframe that residents access as needed: virtual worlds are predicated upon the possibility of cloud computing.

However, I have indicated throughout this essay that while my interest in virtual worlds first drew cloud computing to my attention, cloud computing already shapes a far broader range of social domains, and deserves extended attention—not just theoretical attention, but ethnographic attention, precisely because “clouds” appear soon at first glance to be so incompatible with such ethnographic attention. In addition, the intertwined cultural, political, economic, and technological aspects of cloud computing may shed light—or should I say, precipitate insight—regarding pervasive emergent dynamics of mobility and interconnection. Not for nothing is Apple’s proprietary cloud computing service, complete with icon of fluffy white cloud against clear blue sky, termed “MobileMe.” It appears that it was sometime in 2002 that the number of cell phone lines first surpassed the number of what are now termed “fixed telephone lines” or simply “land lines” (Castells et al., 2009:8). Phones, computing: everything seems to be leaving the land and moving to the clouds. So how, to paraphrase Claude Lévi-Strauss, might clouds be “good to think” (Lévi-Strauss 1971:89)? How might we find important clues to emerging cultural logics in a partly cloudy horizon? Might the key to new imbrications

of culture and technology lie neither in the search for beginnings and points of origin, nor in the quest for endings and points of resolution, but in the liminal, untethered non-place of a cloud?

Bibliography

- Boellstorff, Tom. (2008). *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human*. Princeton: Princeton University Press.
- Castells, Manuel, Mireia Fernandez-Ardevol, Jack Linchuan Qiu, and Araba Sey. (2009). *Mobile Communication and Society: A Global Perspective*. Cambridge, MA: MIT Press.
- Kelty, Chris. (2008). *Two Bits: The Cultural Significance of Free Software*. Durham: Duke University Press.
- Lévi-Strauss, Claude. (1971). *Totemism*. Boston: Beacon Press.
- Rosch, Eleanor. (1973). Natural Categories. *Cognitive Psychology* 4:328–50.
- Wagner, Roy. (1989). *Symbols that Stand for Themselves*. Chicago: University of Chicago Press.
- Yanagisako, Sylvia, and Carol Delaney. (1995). Introduction. Pp. 1–19 in their edited *Naturalizing Power: Essays in Feminist Cultural Analysis*. New York: Routledge.

ⁱ I will sometimes refer to “cultures of the cloud” and at other times “culture of the cloud.” As always, the analytical purchase of referring to a singular “culture” versus plural “cultures” is more about how one conceptualizes interconnection than it is about multiplicity and inclusion: with regard to cloud computing there will surely emerge both overarching cultural logics and innumerable cultural specificities shaped by place, subjectivity, topics of interest, and so on.

ⁱⁱ See <http://en.wikipedia.org/wiki/Cloud_computing#History>, accessed November 8, 2009.

ⁱⁱⁱ See <<http://thecloudcomputing.org/2009/2/>>, accessed November 18, 2009, <<http://www.ux.uis.no/cloudcom.org/indexmain.htm>>, accessed November 18, 2009.

^{iv} See <<http://docs.google.com>>, accessed November 18, 2009.

^v See <<http://www.flickr.com/>>, accessed November 18, 2009.

^{vi} See <http://www.youtube.com/watch?v=0QRO3gKj3qw&feature=player_embedded>, accessed November 18, 2009.

^{vii} See *The Economist*, October 17, 2009.