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Capturing Glocality— Online Mapping Circa 2005[1] *Part Two: Mapping Glocalities*

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ABSTRACT This two-part paper explores the sources, motivations, and consequences of emergent online mapping activities, circa 2005. Online mapping, defined as mapping software applications and associated cultural practices that utilize the Internet as a primary infrastructural component, arises as an information retrieval technology, twice-over. Its technological ancestors are maps of territories in the form of geographic information retrieval technologies originating with remote sensing and Geographic Information Systems (GIS) software, and maps of information in the form of Web-based information retrieval technologies that comprise search engines and website classification systems. Online mapping is a product of the convergence of these technologies which each had reached a critical tipping point with regard to data management.

This paper contends that to reduce and manage excessive amounts of information, each adopted strategies that retailored both Web-based and geographic information management to focus on the local as the site for globally scoped information retrieval. During the Cold War, a clash between the U.S. Air Force's directive to amass untold quantities of uncalibrated satellite data and the Army's mandate to systematize and manage that data produced the World Geodetic System and paved the way for the GIS technologies at the heart of Navteq and Google Maps. Now, as the amount of information on the Web grows exponentially, Web-based information retrieval technologies face a similar dilemma. *Personalized search* (epitomized by Google) and *folksonomy* (user-contributed keywords) are superceding top-down directory classifications (like the early Yahoo!).

Secondarily, while the cultural practice of mapping remains, above all, a matter of representation, this paper asserts that online mapping departs radically from traditional cartography. Online maps forsake the techniques and precepts of visual representation, as typified in centralized, perspectival systems of optics that aspire to global extent. Instead, engaging distributed, data-centric systems that operate locally, online maps achieve representation through what Philip Agre describes as technologies of informatic capture.

Three case studies (Google Maps, map hacks and mashups, and folksonomy-based neighborhood maps) employ this representational mode to produce maps of glocalities, indicating a cultural shift toward merging dominantly optical and dominantly informational worldviews, and toward infusing global networks with local practices.

INTRODUCTION Today, online mapping is as ubiquitous as mobility itself. Emerging from a subway, shifting into gear for a long distance drive, craving chocolate, or desperately seeking a hardware store—all these activities entail instinctively grasping an iPhone and tapping one's way to its Google Maps app, confident of imminent orientation. More than that of any other smart phone or mobile platform, the iPhone's widespread popularity can be credited with catapulting online mapping into second nature for millions of users. So even as bloggers are betting on whether iPhones have jumped the shark, Google Maps has become nearly synonymous with the device's ability to augment reality through customized, data-driven and location-based insights, as relevant to terms of a search query as they are relevant in terms of geographic proximity. In 2005, prior to the iPhone's introduction, this was hardly the case.

That year, Google Maps was released in a browser-based Beta, and online mapping practices swelled in short-lived cult circulation. This project explores the sources, motivations, and consequences of that proliferation of emergent online mapping activities. Online mapping refers to mapping software applications and associated cultural practices that utilize the Internet as a primary infrastructural component. The experimental online maps produced circa 2005 are already obsolete artifacts of a faddish moment, but are noteworthy for their naïve embodiment of the homebrew spirit and distributed production processes characteristic of Web 2.0.1 To delve deeply into the history leading up to their production allows online mapping to serve as a lens, bringing into focus certain cultural currents that reverberated throughout Internet and mapping technologies during the emergence of Web 2.0. Chief among these was a trend toward glocalization wherein global networks and local usage dovetail in a feedback system. Indeed, given the "global village" meme associated with the Internet's early development, it may be surprising to consider that a main contention of this paper is that, circa 2005, online mapping practices were overwhelmingly oriented to the local. In this way, online maps help to locate Web 2.0 as being, first and foremost, situated.

This project appears in *Parsons Journal for Information Mapping* in two parts, "Mapping Territories"[2] and "Mapping Glocalities," unified in their treatment of online mapping as an information retrieval technology that is, like all technologies, engineered to accommodate explicit cultural predilections. Yet, technologies enforce and disallow specific forms of behavior on the part of their users. So, just as glocalization implies a continual negotiation between local and global demands, a culture that deploys online maps is also regulated or "programmed" by those maps.

Online mapping arises as an information retrieval technology, twice-over. Technologically speaking, its direct ancestors are geographic information retrieval technologies originating with remote sensing and Geographic Information Systems (GIS) software, and *Web-based information retrieval technologies* that comprise search engines and website classification systems. Online mapping is a product of the convergence of these technologies. Independently of one another, each had reached a critical tipping point with regard to data management. In the need to reduce and manage excessive amounts of information, each adopted strategies that retailored both geographic and Web-based information management to focus on the *local* as the site for globally scoped information retrieval.

In assessing online maps as information retrieval technologies, a central concern must be to analyze the practices through which information is retrieved. In his work concerning technology and privacy, scholar Philip E. Agre draws a distinction between two methods for acquiring information: *surveillance* and *capture*.[3] In broad terms, surveillance indicates a cultural model respecting privacy that includes optical, centralized, and coercive techniques for tracking people and things. Capture, an alternate cultural model, refers to informatic, distributed, and consensual systems of tracking. This project explores the application of these concepts to emergent models of online mapping and to the antecedent technologies that comprise it. In general terms, I conclude that online mapping has more to do with capture than surveillance for the reason that surveillance aspires toward a global, total apprehension, whereas capture embodies a local, situated focus. Using these two concepts to consider online mapping leads to a secondary conclusion that, although capture engages users' voluntary participation, arguably creates greater privacy concerns than would be present in a surveillance situation. Even so, because capture operates through an aggregation of loosely affiliated distributed systems instead of a unified monolithic one, local information capture allows for personal interventions into global systems which would otherwise remain impossible or invisible.

In principle, the restructuring of Web-based and geographic information retrieval technologies marked a shift from a surveillance paradigm to a capture paradigm. Attempting to manage people and territories, geographic information retrieval systems relied first on remote sensing and reconnaissance surveillance which eventually gave way to GIS and capture. Just as reconnaissance surveillance is geared toward establishing concrete identities of people, places and things, Web-based information retrieval technologies first sought to facilitate the management of information by developing global systems to convey definitively identified documents. Like geographic information retrieval systems previously, Web-based information retrieval technologies had, by 2005, begun to shift to relative strategies which, like capture, rest on linkage and relative context, rather than a rarified approach to content.

Both Agre's concept of capture and geographic information retrieval systems were analyzed in depth in Part One of this project. In summary, Part One discussed how online maps build on GIS which itself evolved from cybernetic remote sensing systems that produced photographic raster information composed of pixel data. These pixel data were dimensionally stabilized and globally standardized through the inventions of the World Geodetic System and of ortho-pixels. As a result of the World Geodetic System, the object of surveillance was effectively zoomed out—transformed from the task of gleaning local insights to one of comprehending a unified, global totality. The optical point of view underlying remote sensing was no longer necessary to provide locational context for an image, for the reason that as data, the image itself was already composed of geo-coded units, *ipso facto,* through ortho-pixels. Hence, the optical character of the image was supplanted by the informational character of the image. From this stage, it remained only for the sequential organization of ortho-pixels to be computationally transformed into vectors. Vectors maintained ortho-pixels' encoded georeferencing, while being, in informatic terms, more flexible. At the stage of vector data, optics are replaced by location as a means for relating to the world—location itself being an aspect of code. Geo-coded, location is subject to endless processing as one attribute of an inherently scalable, recombinant data form. Online maps are therefore no more about surveillance than they are about any form of *looking* at the world. Rather, they are about *processing* the world as a form of information.

Part Two, the present portion of this project, begins from this notion, which leads to two important areas for consideration. First, that online maps treat location informatically. This requires assessing a second trajectory in the heritage of online maps: the history of maps of information. Maps of information are software tools that assist Internet users in accessing information. Where maps of territories aid information retrieval in cartographic space, maps of information facilitate information retrieval in the data spaces, or "cyberspaces," of the Internet. The two most common categories of information mapping tools are search engines and classification models, each of which are surveyed historically in the first part of this paper.

The second insight we gain from the history of mapping territories is a comprehension of how, as a whole, online mapping is both a local and localizing practice and, fundamentally, an informational one. In this trajectory, online maps appear at the point of the inversion of the cybernetic principles of remote sensing. In remote sensing, machines help humans find what is farther; in online mapping, humans help machines index what is closer. This vacillation echoes across online mapping in its negotiations between human and algorithmic judgment, optical and informatic cartography, specific and generalized data and, perhaps most critically, global and local scopes of meaning. The second part of this paper examines three case studies that explore how, circa 2005, online maps embodied and negotiated such hybridizations. Unlike search engines, they made material, inhabited territories informatically findable; unlike traditional GIS, they networked geographic information related to specific individuals, not statistical aggregates. In these collisions of informational and territorial mapping, curious products arose: *maps of glocalities*.

Writing in September of 2005, Danah Boyd offered the following definition of glocalization:

> *In business, glocalization usually refers to a sort of internationalization where a global product is adapted to fit the local norms of a particular region. Yet, in the social sciences, the term is often used to describe an active process where there's an ongoing negotiation between the local and the global (not simply a directed settling point). In other words, there is a global influence that is altered by local culture and re-inserted into the global in a constant cycle."*[4]

Boyd understands glocalization as the motivating force behind Web trends that included technologies like folksonomy and open APIs, discussed below, both involved in online mapping. I suggest that this interchange and ongoing reconciliation between local and global contextualization is precisely the dynamic of online mapping. On the whole, glocal mapping indicates a cultural shift toward merging the dominantly optical worldview, associated with traditional territorial cartography and the dominantly informational worldview, encapsulated in Google's view of the *world as information*,[5] and toward infusing global networks with local practices.

Indebted to both information and territorial mapping, emergent online mapping was a profoundly hybridized technology. As such, it was caught in between; a product of industries generating global geographies and standardized data sources on one hand and of local users bringing to bear neighborhood territories and personal relevance on the other. While the online maps discussed here were fleeting phenomena, the history of factors giving rise to these practices on the twin fronts of territorial mapping and information mapping suggest that as online maps engage local capture toward globally scoped information retrieval their technologies grow more *glocal* over time.

PART TWO: MAPPING GLOCALITIES

MAPS OF INFORMATION

Because, as we have seen, GIS renders location informatically, online maps need to be understood not only as maps of territories, but also as maps of information. Maps of information are Web-based information retrieval tools that can be divided into: techniques for searching for information by query, and techniques for classifying information according to ontological schemas of meaning. By 2005, both search and classification had evolved away from the original methods developed during the early years of the Internet. Significantly different practices distinguish older search engines, which parse keywords, from second-generation search systems, best exemplified by Google, which evaluate link structure.[6] Similarly, there are two approaches to classification: directories and folksonomy or social tagging.

In both cases, two major strategies represent the two generational approaches to information mapping. A top-down, centralized set of techniques that analyzes content has given way to an alternate set of bottom-up, distributed techniques that analyzes the social practices through which content circulates. By top-down, I refer to an organizational structure in which control is administered by a proportionately small, concentrated authority that extends its privilege globally. By way of contrast, in bottom-up structures, control initiates from a broad base that makes low-level, local decisions, cumulatively directing system-wide conditions. Directories and traditional, keyword-based search engines largely adhered to the former approach, whereas today's search, which like Google accounts for links and embedded network intelligence, merges top-down and bottom-up. Folksonomies adopt the bottom-up approach. Comparing first- and second-generation approaches to search and classification shows a tendency toward convergence among second-generation online information retrieval techniques. Google and folksonomy approach information mapping in only marginally different ways.

First-Generation Search: Mapping Content All search engines contain three major elements, outlined by John Battelle in his authoritative history of search engine development: "First is the crawl (or spider), which gathers every possible page on the Web. Second is the index, the massive database created by that crawl. And the third comprises the user interface and search software, which take the index and make it available in an intelligent fashion to the end user."[7] Each search service surveyed here employs some variant of this basic recipe for search.

The first search engine was a pre-Web application dating from 1990 called Archie. Archie used a command-line interface, ran on an ftp structure, and cataloged only document titles, excluding all other content.[8] Over the next few years, search made incremental advances, with Gopher adding the point and click interface that would eventually underpin web directories,[9], the WWW Wanderer adding a Web-based architecture, and the WebCrawler adding full text indexing. Yet only in 1995, when Louis Monier of DEC's research wing launched AltaVista as a showcase of the speed and power of its Alpha processor, did the extent of search's usefulness and power became evident. With AltaVista, Monier radically enhanced crawling methods by employing a thousand simultaneous crawlers with the aim of "creat[ing] an index of the entire Web, not just of urls."[10]

Eventually acquired by Compaq, AltaVista was transformed into a portal in 1998, a trend replayed by many of the major search engines in competition in the late nineties. Each innovated aspects of Battelle's three-part formula for search. For example, the Carnegie Mellon project, Lycos, became "the first major engine to use links to a Web site as the basis of relevance,"[11] and to derive a Web page's relevance and semantic meaning by analyzing the textual content of its outbound links. Excite, which acquired WebCrawler along with Magellan in 1996, statistically evaluated the relationships between words in a document, claiming to provide results through assessing content conceptually, rather than through a keyword-based view of content.

Such first-generation search engines pursued top-down, content-driven approaches to information retrieval in the form of "complete" searchability. Maximizing content data lay at the core of their efforts, which focused variously on expanding the scope of the index, or the comprehensiveness of the crawl, or, in one way or another, deterministically analyzing a document's content for clues about its relevance with regard to a search query. These companies integrated first-generation search into the centralizing logic of being a portal site. Portals aspire to be central hubs or destinations for web surfing. Search was one in a collection of features designed to lure users into spending more time at their "homepage." However, Web-based search, which seeks to move users on to other sites, is fundamentally at odds with the portal model.[12]

First-Generation Classification: The Directory Map

The only remaining major player from this era, and in 2005 the only serious challenge to Google's dominance in search, was Yahoo!. Although itself a portal, Yahoo! originated as a directory.[13] As a result, its strategy best exemplifies the first-generation, top-down approach to findability in classification. Yahoo! began in 1994, developed by two Stanford PhD students, Jerry Yang and David Filo, who built their first crawler as a scheme for winning a fantasy basketball league. Initially a list of links reflective of their personal tastes, "Jerry and David's Guide to the World Wide Web" set out to catalogue "interesting" documents encountered in cyberspace. The site was renamed "Yahoo!" in 1995[14] and as the list grew in length, its organization soon required the addition of hierarchical category headings and subheadings, a structure the company still refers to as the "core concept behind Yahoo!."[15] (In fact, the company's tongue-in-cheek backronym is "Yet Another Hierarchical Officious Oracle."[16]) Yahoo!'s beginnings as a hierarchical directory are evident in its current incarnation as a portal, providing a steadily expanding range of web services. Only in its second year did Yahoo! add search capability. From 2000 to 2004, Yahoo! contracted Google's search before developing a service of its own by combining the strengths of several acquisitions.

Yahoo!'s success during its early development can be partially attributed to the close match between its editors' sensibility and its users' tastes. From one perspective it is argued that Yahoo! reflected the feeling of discovery with which early users encountered the Web. Its directory format encouraged surfing as a process of "exploration" wherein interesting things are encountered, as opposed to goal-oriented "expectation" wherein relevant documents are actively sought.[17] However, scholars Helen Nissenbaum and Lucas Introna describe the inherent bias in both algorithmic search and directories because human editorial and algorithmic decision making each define the shape and scope of informational transactions.[18] In this view, it is necessary to critique the naturalization of apparent symmetry between users' and editors' views; the latters' selections predetermine the range of expressivity available to the former.

In its inception, Yahoo! took what critic Clay Shirky and others have dubbed a hierarchical ontological stance toward classification.[19] In Shirky's estimation, the directory structures of first-generation classification overlay falsely constraining habits from the object-oriented physical world onto virtual systems. While physical objects can only be in one place at a time, Shirky argues that the concept of "place" in a virtual system is misleading to begin with. As has been frequently observed, digital files can be duplicated ad infinitum, eroding the sense of an authentic original which could "belong" in the ontological sense. What matters for Shirky and others who share his views is not *where a given thing is*, but *how people access it*. This represents a shift in thinking away from a principle of location, the prime currency of first-generation classification, and toward a principle of navigation.

Second-Generation Search: Mapping Links

As Shirky notes, second-generation information mapping systems such as Google's assume precisely this outlook. Instigated in 1996 as a project of two other Stanford PhD students, Larry Page and Sergey Brin, Google's approach to Web search (and to network practices as a whole) is based on leveraging link structure.[20] Google began with Page's insight, gleaned from the systems of peer review, citation, and annotation used in academic publishing,[21] that "while it was trivial to follow links *from* one page to another,"—as Lycos had previously implemented — "it was nontrivial to discover links *back*."[22] Implementing this on a massive scale, *BackRub* (Page's first project) sought to find, store, reverse, and republish every link on the Web so as to "reveal not just who was linking to whom, but more critically, the *importance* of who linked to whom, based on various attributes of the site that was doing the linking.[23] To this end, Brin and Page invented PageRank, an algorithm that factors two levels of in-bound links into its ranking determination.[24]

As Page and Brin experimented with BackRub, and reviewed the ranked results from its crawl, they realized that it could easily be made into a search engine. After first testing a minimal title-based version, they created Google, "utiliz[ing] a number of factors to rank search results including standard IR [Information Retrieval] measures, proximity, anchor text (text of links pointing to web pages), and PageRank."[25] Factoring for referrers, rather than merely content, produced considerably more relevant results than those of existing commercial search engines. In addition, it was apparent that their search engine would scale. Outside of hardware, BackRub's main resource is also the Web's main activity: linking. In one of two rare papers the pair published in 1998, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," Page and Brin indicated their confidence that "most of the data structures will deal gracefully with the [Web's] expansion."[26] In a nod to its potential for ambitious scalability, Page and Brin named their search tool "Google" after a misspelling of Googol, a mathematical term for 10^{100}.

Google's approach to information mapping was audacious for two reasons, both of which characterize second-generation information mapping. First, it changed the standards for search from *content* to *connectivity*: concern with *meaning* became concern with *mention*. Second, its ranking algorithm seemed to literally remove human expertise from the equation: expert encoding and decoding[27] were replaced by machine-readable social codes of valuation. In so doing, Google was treating meaning as locally embedded. Instead of an essential property of a thing itself, the meaning of something was a mutable, social property born out in relationship to its neighbors. In "The Anatomy of a Large-Scale Hypertextual Web Search Engine," Brin and Page explained that Google concentrated not only on the document itself—its information and meta information—but on what they term "external meta information [defined] as information that can be inferred about a document, but is not contained within it."[28] Above all, Shirky notes, shifting the focus from content to link structure (or from location to navigation) allows Google's information map to "decide what goes with what after hearing from the user, rather than trying to predict in advance what it is [users] need to know."[29]

Google's formula for search has proven tremendously successful. While Google was the first to recognize that linking and reputation could add value to search, these insights now motivate most major Web enterprises. For example, companies like eBay and Amazon have adopted similar strategies in creating economies of reputation and recommendation. Likewise, the infrastructure of the blogosphere, as well as with social software sites like Facebook, MySpace, and Twitter, run through linking and back-linking elaborate relationship networks.

First-generation search and classification methods view the Web as a collection of documents. Second-generation search uses a topology-based view, wherein the network is conceived as consisting in its link structure, and definitional weight is attributed to the relations conveyed by those links. Unlike link-based search, first-generation content-based search assumes that some portion of a given document contains what it is "about." Crawls extract and catalogue the "about-ness" that has been pre-coded into the content of each document, whether as meta-data encoded in the document's header or as information semantically included in the document body.[30] For a document to be findable for search users, the data inscribed by the programmer or content provider and the search terms selected by the search user must match. Thus, as a strategy for information retrieval, search based in content faces exactly the same problems that Shirky has isolated in relation to hierarchical directory classification: it requires a level of terminological symmetry capable of resolving to impossible levels of abstracted prescience. In such a method, accuracy or relevance, the criteria for evaluating information retrieval, would entail not only an initial "objectively" accurate assessment of every document's about-ness, but also a complete, pre-defined vocabulary with denotative specificity, and universal knowledge of and agreement on that vocabulary.[31]

Shirky's complaint about Yahoo!-like directories is that they are unable to accommodate complexity or change because they impose the categorization policies of human experts. Yet, as Nissenbaum and Introna propound, a similar objection can be made about Google. Google ranks according to a proprietary algorithm, whether or not that algorithm rides on the clickstreams[32] of an amateur, distributed user base. In reality, Google represents a strange mixture of distributed and centralized systems. Early on, Brin and Page identified its competitive scalability with its "centralized indexing architecture."[33] This suggests that what may be most crucial in evaluating an information mapping technology is an aspect aside from the issue of whether its processes adhere to bottom-up or top-down formal structures. What matters is the transparency of those processes. In second-generation classification, these processes are rendered explicit through participation.

Second-Generation Classification: Tagging (Multiple) Meanings

Folksonomy is a portmanteau coined by information architect Thomas Vander Wal to mean "folks' taxonomy." It is a transparent social categorization method through which users create their own keywords, tagging online content according to personal, intuitive selection. The early search engines discussed above determined the about-ness of a page by crawling for keywords, meta-tagged data contained in a document's header. Keyword tags provide information about information, but when they are encoded into a page, they become vulnerable to the weaknesses of hierarchical ontologies. Folksonomy also uses tagging to provide information about information; however groups of users supply tags post hoc, apart from the content in an uncoordinated fashion. Moreover, folksonomy tags can be statistically analyzed en masse through data clustering algorithms to reveal degrees of relatedness between keywords in addition to the frequency of their occurrence. Clustering can be defined as the algorithmic division of a data set into subsets based on degrees of similarity with regard to selected characteristics. Much as Google's PageRank algorithm determines relevance not only by counting hits, but by weighing some more highly than others, clustering algorithms build a layer of qualitative, connotative meaning over purely quantitative, denotative criteria. The result is an inherently bottom-up, user-centric, social, emergent, relational way of organizing information. By allowing user communities to collaboratively map information, folksonomy produces locally scoped vocabularies of meaning. In this respect, it is an example of social software; as a map of information, its power emerges in the convergence between individual selection and communicative networked sharing.

Two popular examples of folksonomy-driven sites are Delicious and Flickr, a social bookmarks manager and photo-sharing site, respectively.[34] How the year 2005 was framed by a transition between first- and second-generation versions of classification is evident in the interest Yahoo!, the quintessential Web directory company, took in both of these folksonomy start-ups. Flickr was acquired by Yahoo! on March 20, 2005, as was Delicious on December 9, 2005. At Delicious and Flickr, users can browse personal content as well as content tagged by others. For example, Delicious lets a user view:

- All of his or her bookmarked links,
- All links he or she tagged with a given keyword,
- All links tagged with that keyword by all users ,
- All links tagged with that keyword by a specific user other than the given user, or
- All tags attached to a given link by all users.

These last three examples highlight the social aspect of the process, which has also been called "ethnoclassification"[35] and "cooperative classification."[36]

Folksonomy's flat namespace allows associative meaning to develop as an emergent property of social metadata. In Adam Mathes' definition, the flat namespace means that, unlike directory structures composed of tiered headings and subheadings, "there is no hierarchy, and no directly specified parent-child or sibling relationships between […] terms."[37] Instead, lateral associations between words are understood always in relative terms through "related" groups, "clouds," or "clusters." Continuing, Mathes explains that "unlike formal taxonomies and classification schemes where there are multiple kinds of explicit relationships between terms [...t]hese relationships include things like broader, narrower, as well as related terms."[38] Clustering analytics, used in a wide array of fields ranging from bioinformatics to computerized object recognition to marketing and, as readers of Part One will recall, geodemographic profiling, are a means of assessing such relationality. Clustering reveals the social processes at work in folksonomy: clusters—called "clouds" on Flickr and "tagrolls" on Delicious—illustrate trends toward consensus. Clustering aims "to determine the intrinsic grouping in a set of unlabeled data."[39] However, the naturalizing rhetoric of claiming that any value is "intrinsic" to data should be questioned. How alike is like enough? Clustering's insights are subjective, a point that becomes all the more critical when the data being clustered represent human beings and culture, as is often the case in online mapping.

Individually or in clusters, folksonomy tags function as filters that can be selectively imposed on the global dataset composing every undifferentiated tag in a flat namespace. This aspect of tagging is also found in second-generation search engines,[40] including meta-search engines, like Metacrawler, that run simultaneous searches on other search engines and compile the results. For example, Clusty, developed from Carnegie Mellon University's Vivísimo engine,[41] uses clustering algorithms to thematically group search results, while Dogpile, and previously A9, Amazon's now discontinued search engine, cluster results according to content type.

This relationality builds the capacity for revision and multiple, contextual meanings into the information mapping process. Shirky argues that on the whole this makes folksonomy "better for cultural values" than traditional classification schemes.[42] Yet Shirky's view ultimately reduces folksonomy to the process of establishing *cultural consensus*—similarity of views between parties or, as in algorithmic clustering, similarity of data attributes. To this end, danah boyd contends that "[i]n tagging, quality is not just about 'accuracy', but about what cultural assumptions dominate."[43] Boyd correctly identifies that every perspective on "meaning" is culturally situated. Thus accuracy and consensus are misleading standards which can "only [be] meaningful if we share the same cultural assumptions."[44] Moreover, opposing top-down standardization to bottom-up agreements runs the risk of over-emphasizing shared meaning. Folksonomy is an informational social structure that leverages difference, working t*hrough the inherent asymmetries*—the degrees of difference and similarity—between people in relation to language, power, and above all, meaning. The view that classifications are *cultural* runs through the work of sociologists of science Geoffrey C. Bowker and Susan Leigh Star, whose nuanced studies detail the ways that classifications enact power to various ends.[45]

For critics like Shirky, folksonomy-driven sites like Delicious and Flickr exemplify emergent, bottom-up, populist technologies. However, technologically, they derive their power through social structures that are very similar to the corporate-owned and corporate-operated technologies behind sites like Google and Amazon. Their similarity indicates that the personal plays a significant role in driving both second-generation search and second-generation classification. A case in point is the "popular" tag on Delicious.[46] http://del.icio.us/popular is a cluster of links that are in the process of being tagged by many users over a short period of time. Delicious/popular bears remarkable resemblance to Google's Zeitgeist, a page that lists "top gaining queries" by week and other "tidbits of information related to the search behavior of Google users."[47] Introducing Zeitgeist, Google wrote that, taken cumulatively, users' "flurry of searches often exposes interesting trends, patterns, and surprises."[48] This is precisely one of the insights Shirky claims for Delicious.[49] By sharing the rhetoric of emergence, corporate and grassroots models of second-generation classification both equally risk obscuring the cultural aspect of algorithms. Both Zeitgeist and Delicious/popular engineer the trends they report. But while Google claims to be "surprised" by the information generated by its own algorithm, Delicious more ingenuously discloses its participation, along with its users, in creating the relative popularity of data.

Generational Convergences: Informatic and Territorial Glocalities

We have seen that search engines and online classification systems are two schools of Web-based information retrieval systems. Classification relies on human decisions while search engines rely on algorithmic determinations; however, both map information culturally. As the Internet developed, extreme growth in the Web's information corpus overburdened first-generation information retrieval techniques. Due to their reliance on permanent, ontologically unified, and absolutely referenced strategies for mapping information, these systems were unable to achieve accuracy or relevance when coping with massive amounts of data.

In response, a second generation of techniques emerged. These mapped information according to link-based network topology, rather than according to content-based document properties. Folksonomy and link-based search engines like Google map information through contingent, distributed, and relativist techniques. This approach to information retrieval invests in generalization as opposed to specificity, and is better suited to data management on a vast, and global scale.

Significantly, the transition between first- and second-generation information mapping runs directly parallel to the history of mapping territories discussed in Part One. In Part One we explored how, in mapping territories, information retrieval evolved from "targeted looking" aerial reconnaissance missions governed by the U.S. Air Force's fixated interest in specificity of content to the CIA's "vacuum-cleaner approach" to data acquisition. This generated an overproduction without accountability, facilitated by surveillance satellites' continuous coverage. Both taxed existing means of data interpretation, an analog for the first-generation Web which was similarly fixated on content and its location. Just as the U.S. Army's mandate for data reduction instigated the invention of ortho-pixels[50] and the creation of the World Geodetic System, second-generation search and folksonomy are analogous software solutions that also prioritize context above content and relational flexibility above one-off, hard-coded specificity. Ironically, it would be impossible for second-generation techniques to manage global content save for their ability to algorithmically leverage investments at the local, personal level. And it is precisely this reinvestment in the local, on the part of global mapping technologies, that characterizes the glocal impulse behind early online maps.

MAPS OF GLOCALITIES

The remainder of this paper presents three case studies: Google Maps, mapping hacks and mashups, and folksonomy-based neighborhood mapping projects. Taken together, these give an account of the diversity of mapping practices found online during the year 2005. While these examples of nascent online mapping run the gamut from professional to amateur and from search to classification paradigms, they are united by their attention to personal relevance and situated local practices in global contexts. All are maps of glocalities.

Case Study 1: Searching for the Local on Google Maps

Since 2005, Google Maps has grown to become the most dominant figure in online mapping; so extensive is this growth that the other mapping case studies appear as historic novelties in comparison. Google Maps was released in Beta on February 8, 2005. Like many of Google's Beta projects, Google Maps proved an immediate and popular success; acclaimed both for its interface as well as for the fact that it offered an open API (Application Programming Interface) code which in effect gives programmers a window into Google Maps through which to create their own mapping projects. By late June, when Google released Google Earth,[51] a three-dimensional flythrough navigation interface for satellite imagery, enough programmers were experimenting with map hacking to intimate another emerging Web trend.[52] Yet eight months later, comparatively little fanfare accompanied Google's announcement of a subtle name change for one of its star products. On October 6, 2005, Google officially merged its Local Search and mapping services. For a short time, the products became jointly and synonymously referred to as "Local Search," an overlap that is critical to assessing the significance of Google's mapping and local offerings in the context of its broader endeavors. Then, less than seven months later, on April 21, 2006, Google changed the name again, re-rechristening the merged service "Google Maps."[53] Defending the first name change to "Local Search," Google wrote, "At that time, we thought it was most appropriate to name the integrated product 'Google Local' to emphasize the broad searching capabilities of the site and that it was much more than an ordinary mapping site." Google explained the second change back to "Google Maps," as a response to user feedback. Oscillating in this way, Maps/Local appears as a synecdoche for the company's larger ambition to capture "the world's information." At the same time it is a reminder of populist sway in online mapping. In the following discussion of the Maps/Local assimilation that ran throughout 2005, the original product names are maintained throughout, with "Google Maps" referring to the API and the first 2005 iteration of the map interface, "Local Search" designating location-based search functionality and its associated marketing strategies, and "Maps/Local" indicating the integrated product.[54]

The Google Maps Interface. Among the most innovative features of Google Maps is its user interface, which was greeted from the onset as a significant improvement over existing services—setting Google's map offering apart from established sites such as MapQuest. The interface used AJAX, a combination of JavaScript and XML, to create an intuitive user experience. Clicking and "dragging" allowed the user to virtually "grab" the map image so as to pan to off-screen sections. AJAX allowed the content of the map's viewing area to be manipulated and updated without requiring the entire webpage to refresh. The resulting user experience was intuitive, direct, and uninterrupted. Being able to manipulate the map in this way supported a pretense of seamless mastery over both the map's technology and its depicted territory, lending the impression that users had at their disposal a giant map that extended beyond the viewing area to cover the totality of the globe. Of course the control Google seemed to impart to its users was an illusion of the interface and, even by contemporary technical standards, the depicted world is far from "seamless."[55]

Google Maps are compiled of numerous individual image tiles. Google's AJAX code is responsible for maintaining the illusion of continuity by preloading those neighboring image tiles which immediately surround the current viewing area. When the user grabs and drags the map, the next images should be ready and waiting. It is possible for Web users to break this illusion and catch a glimpse of the underlying script by dragging the map repeatedly and quickly to out-pace the preload script and expose "naked" tiles. Indeed, in more recent years, grey, unloaded map tiles have become a familiar sight for users of Google Maps for Mobile, who access maps through mobile data networks whose limited bandwidth impairs preloading.

In its standard form, the 2005 version of the Google Maps interface offered three "views," in addition to controllers for panning, zooming, and switching between views.[56] The default view, "Map View," shows computer-rendered, named streets from a disembodied overhead viewpoint, which lacks optical perspective. Google leases the vector-based GIS data that comprises Map View from Navteq and another digital map data firm, TeleAtlas.[57] Although Navteq data are principally intended for drivers, the Google Maps interface initially utilized a sparse implementation. Map View provides a skeletal, schematic contour of the map areas. For this reason, I refer to Map View as a *planner's view*. Epitomizing GIS, it uses analytical rhetoric derived from a system of calculation, probability, and efficiency to make claims about a computer-modeled informational world.

The next view, "Satellite View," shows compiled satellite imagery. Google's satellite imagery comes from Keyhole, a company Google acquired in October of 2004,[58] which is also the cornerstone of the Google Earth application released in late June of 2005.[59] Additional satellite imagery is also leased from TeleAtlas. Anecdotal reports indicate that, second to the draggable interface, the presence of satellite imagery was a significant selling point for many early Google Maps users. Through Satellite View users could see and navigate their own environments from a perspective which they could never inhabit physically. This optical perspective, from which no human has ever looked, is the perspective of an *optical machine:* a satellite camera. Satellite View offers a *camera's view* that uses optical rhetoric derived from a system of lenses, light, and refraction to make claims about a recorded visible world.[60]

However, for understanding how Google maps glocalities, the most consequential of the three Google Maps views available in 2005 is Hybrid View, which superimposes the planner's and camera's views, to at once supplement and neutralize their alternate rhetorics. Hybrid view is an incredibly substantial aspect both of the Google Maps interface and of the Maps/Local product as a whole, for the reason that its overlay represents a tremendous leap of faith. *Hybrid View asks users to accept that informational and optical representation—which have been hereunto separate—are compatible.* In fact, what Hybrid View makes apparent is precisely the data layering principle at work in all GIS. The upper right hand corner of the Google Map contains controllers that allow users to swap perspectives by toggling between views. By implication, the visual device of the overlaid image works, just as seamlessly as this toggling works. We are led to believe that they are all really showing the same thing. Hesitating before such a leap of faith to recall that Google is first a *search* company, we should ask what making this type of integration enables users to *find*.

Google's Local Search. Google's Local Search[61] premiered in the Google Labs in October, 2003 before being released on March 17, 2004.[62] The October, 2005 and April, 2006 assimilations of Maps/Local was evidence that on the product level, the line for Google between mapping practices and local practices was becoming increasingly blurred. Moreover, the name change indicated that Google intended Local Search, rather than a feature such as driving directions or even traditional cartographic navigation, to be the focal point of its Maps features.

Simply put, Local Search allowed users to search for "a what in a where"—that is to search by keyword within a locality to return results of "real world" features. For example, one might search for "New York University" in "New York City," for "bars" in "Brooklyn," or for "alligators" in "the Everglades." Ranked results, listed at the left of the page as text links, correspond to map pin icons, which visually affix the search data to the map surface by indexing it to a geographical location. Clicking a link at left, or a map pin marker, opens an information bubble containing a local search result as well as a portal link to the offsite hit.

At first, this may appear to be no more than a typical search transaction; however, it signals a key factor for assessing Maps/Local. It is only through accepting the *premise* behind the Hybrid View—the *integration* of optical and informational contexts—that Local Search is possible. When one searches for "a what in a where," the "where" is indexed to the world being visually represented on the map, which is the world of optics in which humans operate bodily and locally. The "what," however, is part of the informational world: it is a link in cyberspace. When a user clicks on a local search result link, he or she does not "go" to the "where's" address, but "goes" instead to a "what": a website that contains that address as a text string. A serious conceptual slippage is elided in this transaction, evidenced when, as frequently happens, the general content of the external webpage bears little semantic connection to the user's original search terms.

In bringing together optics and data, the geographic and the informatic, Hybrid View requires precisely the mental leap Michael Curry describes as the process of "switching" inherent to the cognitive processing entailed by GIS.[63] In Maps/Local, users cognitively interpolate for accepting a switch in perspective between, on one hand, an optical space bounded by the laws of physics, and on the other, an informatic space that obeys communications protocols. Hybrid View asks us not only to *switch* between views, but to *hybridize* viewing itself—to create a viewing position that consists of maintaining a state of being between. Hybrid View elides the transition between geographic locality and informatic locality.

In short, the data being "locally" searched has its source in Google's index, and nowhere else in the geographic world. While it is true that Google's variety pack of new digitization projects are increasing that index with more and more "information" ostensibly "from the real world," the information in the index is always a digital document, and is always located on a Google server with its own unique physical location. It is only "real world" information by proxy, and at that, by proxy *twice over*, since Google's index holds cached copies of webpages. A copy of an encoded document containing a textual mention of a parseable address can bear only the most tenuous and most purely semantic connection to the geographic location that address specifies. The textual contents of the document, not the document's locality, and certainly not the locality of a geographically-situated object represented by search terms, are what localizes or delimits the scope of Google's local search.

Consequently, local searching can yield unanticipated results. Intuitively, it seems that searching for a "what in a where" will delimit the scope of a search by intersecting *search terms* with a *geographic area*. But in reality, by matching search terms against a document space (the search engine index), they are intersected with an *informatic area.* Despite expectations for a geographic or material correspondence between a local search term and a local search result, the only connection is linguistic. For example, using my own name as a search criterion, I may not be found *informatically* in the city where I *materially* reside; nevertheless, I can be "found" at addresses that I have never visited. In one case this resulted from a lengthy blog archive page that compiled a mention of my name and of an address in two unrelated posts.

Google gained fame and market share for providing relevant search results. The evident disconnect in searching Google Maps/Local at its onset signaled that something new was underway, a departure from Google's highly successful Web search.

Google's Local Profits. Early Local Search had a much higher success rate in searching for businesses. In fact, its introduction represented an integral component of Google's business strategy, which continues to rely on delivering "targeted" advertisements to searchers. A detailed discussion of Google's business plan is beyond the scope of this paper;[64] however, in essence it hinges on AdWords and AdSense, two reciprocal micropayment systems for "targeted advertising." Google's popularity as a search engine stems from its ability to find relevant results for its searchers. By the same logic, indeed by the same algorithm, it is also able to find relevant customers for its advertisers. Google places contextually customized advertisements on search results pages and on third party websites by carefully parsing and evaluating personal data revealed by users' search phrases, clickstreams, and search histories. Google account holders are presented with still more closely targeted advertisements based on their Google Personalized Home preferences and on keyword scanning of emails sent and received through their GMail accounts. It is easy to see how the ability to *geographically* target users would be of exceptional value to Google's advertisers, particularly those operating brick and mortar businesses. For example, an advertiser who owns a cafe in Portland would be able to advertise directly to customers looking *within the "Portland" area* for "cafes" (or related search terms such as "coffee shop," "coffee," etc.).

This model assumes that searchers are by default consumers. They are, in fact, also producers. Simply searching provides a solution to one of the most persistently opaque marketing dilemmas—finding the right customer. The intent[65] and locational information searchers give to Google in the form of their query is *added value,* and advertisers have been only too glad to pay for it. In an influential article written in the spring of 2005, in which he set forth a scope for Web 2.0, Tim O'Reilly forecasted that the next generation of leading Web companies would invest in owning "core data," broad databases of "classes" of information. While Navteq is the preeminent owner of digital map data, the class of information Google owns comprises billions of clickstreams and search histories, data which millions of users produce for Google *free of charge*. Distinguishing MapQuest's strategy from Google's, O'Reilly explained, "MapQuest pioneered the web mapping category in 1995, yet when Yahoo!, and then Microsoft, and most recently Google, decided to enter the market, they were easily able to offer a competing application simply by licensing the same data." In O'Reilly's analysis, MapQuest neglected to build their own value into Navteq's data by, for example, "harnessing their users to annotate maps and directions, adding layers of value. [Had they done so, it] would have been much more difficult for competitors to enter the market just by licensing the base data."[66] From this business perspective, Maps/Local stood to benefit Google twice over. It localized their search, adding value for advertisement. By providing an interface that solicits locational data, Google easily harvested that data from users. And matched with "intent"-based data mined from its standard search offerings, Googl e had a unique field of data with which to enhance Navteq's maps.

Google's take on local search deviated from that of "pure" local search companies like TrueLocal[67] or Yellow Pages-style sites that don't include maps. I propose that as a market leader, with a hybridized view and a hybridized product, Google was able to advance a truly unique model in which mapping is local searchability. Local Search, by aiming to render the "local," inhabited world searchable and accessible as information, created maps that are data. In short, Google Maps used visual representation—the camera's Where—as a structure for information—the planner's What. And it was an example of the visible world's being portrayed as having informational properties: precisely their "Hybridized" integration. Local Search, thus, should not be mistaken for a "looking for something" kind of search. It worked on the non-optical principle of information capture, wherein searching for a *locality*—a Where—necessarily returns a What: *information.*

Case Study 2:
Situating the Local with Map Hacks and Mashups

When Google released Google Maps along with its API, hacker communities immediately started to play with this code to make mapping hacks and "mashups."[68] By essentially soliciting collaboration from hackers, Google made Google Maps into a web service, a web-based application that interfaces with other web-based data, applications, and protocols over the Internet. Countless dozens of mapping hacks and mashups of varying degrees of popularity began percolating through the blogosphere as a result of Google's open API.

Map Hacks and Mashups. The most popular kind of hacks were mashups which paired Google Maps with a separate source of online data. A forerunner to this type of online mapping was Eyebeam's Fundrace project, which mapped campaign finance records maintained by the U.S. Federal Election Commission during the American Presidential elections of 2004.[69] Fundrace predated Google Maps and the automation offered by its API, but offered similar functionality—even a Neighbor Search feature. Spatializing geo-coded information in the manner of a mashup, Fundrace's stated aim was to offer a transparent graphical interface to make an available data source more easily comprehensible.[70] Even Maps/Local itself can be considered a proto-mashup in that it combined Google's Local Search results with Google Maps through its own API. Hackers who used Google's API were able to display any coded data set in the very same manner as Local Search results were displayed on a Google Map, each with its own interactive map pin icon, and listed as text elsewhere on the page.

Mashups all followed this basic formula. Some simply mapped resources in an area, such as maps of cell phone towers[71] or ATMs,[72] or of traffic cameras showing live video feeds.[73] Others mapped data that changed in real time, such as a map of dart, Dublin's suburban rail network.[74] Several maps were created for purposes of crisis management, including HYDESim, a "High-Yield Detonation Effects Simulator,"[75] and hurricane information maps (more properly hacks than mashups) that allowed communities effected by Hurricanes Katrina, Rita, and Wilma to annotate shared maps of evacuated areas with everything from damage assessments to oral histories.[76] Numerous other maps were more light-hearted, for example Hotmaps, a mashup of Google Maps and HotOrNot that showed "Hot People by Zip Code,"[77] Placeopedia, a mashup that "connect[ed] Wikipedia articles with their locations,"[78] a map of UFO sightings,[79] or an online game of "Risk."[80]

Among the most highly regarded mashups[81] were three public service maps that offered practical value to their respective user communities. Chicagocrime,[82] Housingmaps,[83] and MapSexOffenders[84] were mashups of Google Maps and the Chicago Police Department's Crime Database, Craigslist,[85] and the National Sex Offenders Database, respectively. Most other mashups and map hacks engaged solely with the Google Maps aspect of Maps/Local; they provided a map interface to an existing body of data. In contrast, these sites successfully leveraged the Local Search aspect of Maps/Local as well. In each case, visualization of geographic location information adds an intuitive, practical enhancement to the original data, but that data could also be interactively manipulated through search. MapSexOffenders, for example, was developed in the wake of a missing child search.[86] Two members of the search party, Mark and Aaron Olsen, were concerned that the missing child, a Boy Scout, might have been abducted by a sex offender, as had recently transpired elsewhere in the country. The two created MapSexOffenders in frustration that although sex offender data was public record, it was too opaque to be useful, a motivation similiar to that behind the Fundrace project. In fact, like Fundrace, MapSexOffenders began development before the advent of Google Maps, but the Olsens switched to Google's platform when it became available.

Other sites provided map hacks that took advantage of the API's line-plotting feature for another form of data visualization. For example, one developer who was training for a marathon made a pedometer that used the Google Maps interface to let users calculate distances and burnable calories as they plotted out their excursions on the map.[87] Another site, Maps.Huge.Info, mapped the boundaries of zip codes, towns, or counties.[88]

"Situated Software." Map hacks and mash-ups map idiosyncratically. They are significant for taking something general, like Google Maps, and transforming it into an extremely specific tool. These mapping projects were created to identify and meet a very particular use that had relevance only in a very particular situation. In this view, they are instances of what Clay Shirky calls "situated software,"[89] essentially niche software designed with a specific social group in mind and, most radically, *exclusively* for that local group of end users. Situated software is designed not to scale, in other words, *not* to be global. Shirky says, "Situated software isn't a technological strategy so much as an attitude about closeness of fit between software and its group of users, and a refusal to embrace scale, generality or completeness as unqualified virtues."

Another way of thinking about this is that early map hacks and mashups are *site-specific*, as the term is employed to describe situated contemporary art practices in which the artwork's site is taken to be a part of its material structure. Like site-specific art, map hacks and mashups lose meaning when divorced from the specific context of their local user base. How useful is a map pedometer to a paraplegic? How useful is a real time map of the Irish train system to someone living in Dubai? Such maps become novelties unless encountered within material conditions local to the population that uses them. The local is an integral part of such maps.

The best mapping hacks and mashups were ultimately about *usefulness*; they repurposed the mapping interface, effectively perverting it to suit the needs of the everyday. In the Situationist spirit of detournement, the practice of artfully misusing mass-produced, commercial products toward idiosyncratic, personal ends, their hacks cracked through cartographic formalism, letting the everyday lend meaning to maps, and not the other way around. Understood as site-specific, situated software, map hacks and mashups leaned in the opposite direction from what Google Maps/Local did. Where Google used locality as a tool to enhance the information in its index, they insisted that informational tools be applied in materially local situations.

Case Study 3: Tagging the Local with Folksonomy-based Neighborhood Mapping Sites

A similar impulse motivated folksonomy-based neighborhood mapping, but folksonomy-based sites did not rely on Local Search as an organizing principle as search engines, or even hacks of search-based maps, did. Search is not the only way to organize information on a map—as discussed, keyword systems, apart from search, are an alternate organizational paradigm for mapping information. Folksonomy is keyword tagging in its bottom-up form. By resting entirely on users, folksonomy attains a content and a processing logic that are entirely local and that effect an overtly subjectivist form of data organization. Folksonomy even encourages s*entiment*, a locally-situated feature that would be inconceivable in any keyword system aspiring to global relevance. Folksonomy-based neighborhood mapping tends toward the inscription of meanings that were: more personal than authoritarian, more idiosyncratic than rationalistic, and more ephemeral than stable.

Engaging folksonomy's information mapping practices for mapping neighborhood territories amounts to a kind of homebrew, Do-It-Yourself capture. Folksonomy's tagging structure is informational annotation. It leverages the same division maintained in GIS software layers that separate graphic and attribute data. The maps provided an architecture for uploading and organizing informational annotations, which were precisely information "about" a neighborhood.

Flickr Memory Maps. For example, the Memory Maps[90] pool at the folksonomy-based photo-sharing website Flickr[91] was a user-invented use of Flickr's folksonomy and Google Maps' satellite imagery. Users annotated autobiographical narratives to Google Satellite images and uploaded them to Flickr with a "memorymap" folksonomy tag. This tag associated their Memory Map with the Memory Maps of other users. Memory Maps use Google Map images but exist solely at Flickr.com.

The Memory Maps pool was initiated by Flickr user "mathowie," whose first map, "My childhood, seen by Google Maps,"[92] emplaced memories of long lost friends, adolescent crushes, feeding ducks with his grandparents, and a close call in which he, as a seven-year-old, was nearly hit by a car. Commenting on this map, mathowie stated, "All true stories. I can't believe so many memories exist in one screen full of the map. I wish Google Maps had this kind of annotation."[93] Most of the Memory Maps pool followed mathowie's model, relaying memories from childhood and adolescence, some fond and others bitter in tone. The Flickr format allowed users to outline "hotspots" around specified areas in the image, which could then be moused over to reveal textual annotations. Memory Map stories are fractured by this device, scattered over the image surface. They must be reassembled by the reader from portions that may fluctuate from terse labels or poetic shards to passages averaging at most only a few sentences in length. Autobiographical voice and geographic proximity (figured in the map image) cohere the narratives, which layer episodes that may span several years.

Subsequent additions to the Memory Maps pool included present tense or recently past narratives, mostly in the form of travelogues. These maps narrated points of interest in one concentrated journey or in multiple journeys over a given area. Generally these maps were focused on naming sites, rather than reminiscing. Compared to the fragmented temporality of the childhood Memory Maps, the travelogues maintained a relatively straightforward, coherent temporality. Yet, an interesting aspect of both kinds of Memory Maps is that authors could not predict in what order viewers would encounter and read the pieces of the narrative.

In this respect, the maps call to question the intended role of their audience. Like many social media, Memory

Maps occupied a register between public and private documents, destined for an audience between friends and strangers. Users released their personal recollections to networks of friends, who could subscribe to each other's Flickr photostreams, as well as to the general public, who might view any photograph by browsing the Memory Maps pool en masse. Traversing these three levels of intimacy, however, the maps themselves become strangely familiar documents. Their narratives are familiar—both in the sense of something personal, and in the sense of something clichéd. With subsequent memories sounding more alike than the one before, the idiosyncrasies of each narrator fades, and the pool itself assumes an increasingly stable identity. This same trend toward stabilization has been noted in discussions of collaborative filtering in folksonomy, whereby over time communities tend to reach a general consensus about the meaning of an object.[94]

Whereyouare. Whereyouare[95] was a neighborhood mapping project that provided a tagging protocol through which it aggregated user-contributed neighborhood data from across a number of media and from a number of remote web services. Using unique strings of "ur+zipcode+countrycode" as folksonomy designations, Whereyouare asked users to document their neighborhoods at other folksonomy-based sites by creating and tagging neighborhood-specific Flickr photos, Vimeo videos, Foundcity finds, and Delicious links. The Whereyouare website did not host this content, but rather acted as an aggregator for these offsite services.

Whereyouare described itself as "an experiment in the collective documentation of neighborhoods."[96] Developed by artist Sal Randolph for the Brooklyn-based collective Glowlab, Whereyouare encouraged self-awareness within location-based communities.
It was a grassroots attempt at neighborhood preservation. First motivated by Randolph's concerns over the gentrification of her own neighborhood, the project launched in the shadow of Hurricane Katrina, lending a forcefulness to the artist's entreaty to preserve the "quirky and ephemeral beauties"[97] encountered in everyday situations in neighborhoods the world over. Charged with the task of observing and documenting their surroundings, neighbors grew into a heightened awareness of what was around them, assuming a preservationist's eye and ear.

From Whereyouare, a sense of place could be culled from a network of multimedia artifacts, the general tenor of which was by turns transient, mundane, spontaneous, and discerning. Yet the spaces represented were, without question, shared, community zones. One of the most important aspects of the project was that its maps, as collectively generated portraits of each neighborhood, were not just open to, but were dependent on group participation. On the view of urbanists in the tradition of Jane Jacobs, such participation is the best means of inculcating neighborhood sustainability.[98] Making the map fed back into making the community.

As an aggregator, Whereyouare was a nomadic project, and moreover, one that contained no formal "map." Neighborhoods were "mapped" through the effect of a mental collage, facets of which were dispersed among a number of websites. The Whereyouare website featured minimal architecture, consisting predominantly of outbound links. From its limited pages, users were constantly pushed on to other folksonomy websites, just as they were continually pushed back out into the streets of their neighborhoods to collect still more documentary traces.

Foundcity. Now defunct, Foundcity[99] is a project which accepted user-supplied content and, as in the mashup examples, associated it with a location on Google Maps. Unlike the prior examples, Foundcity also received content from cell phone messages in eight cities. "Finds," or discoveries about a neighborhood, were sent to city-designated email addresses: either a text message, or as a picture message containing folksonomy tags and address information in an accompanying text message. By integrating cell phone technology with user-specified map content, Foundcity was a forerunner in incorporating mobility into the process of mapping.

Unlike the autonomous authorship practiced by Memory Mappers, both Whereyouare and Foundcity employed folksonomy to enable users to create maps collaboratively. But, while Whereyouare was oriented through and through toward community use and group production, Foundcity billed itself as "a personal mapping tool for creating customized maps [...] like having [one's] own personal Google Maps to use any way [one] want[s]."[100] Like Flickr and the Memory Maps pool, anyone could browse Foundcity, but to participate in mapping, users were required to register individual accounts to maintain a collection of folksonomy tags. Once registered, users could opt to make their finds private or public by default; alternately, users could select whether to make a particular tag privately or publicly viewable; users could also further choose to share maps with specified friends.

What makes Foundcity of particular interest is that, as one of the first mapping sites to engage mobile technology, it set mappers to mapping on the fly. Years ahead of Twitter, the near-real-time activity of acquiring and uploading data was, in this respect, a less globally accurate but more locally relevant version of capture as engaged to create massive data fields in global commercial GIS applications like Navteq's GPS (discussed in Part One). Foundcity let users capture just those aspects of their neighborhoods that they found relevant through folksonomy tags in conjunction with mobile phone camera technology. For Foundcity, personal relevance provided an informatic filter. Roaming through neighborhoods in apparently uncoordinated fashion, Foundcity mappers captured a haphazard constellation of snapshots and descriptive phrases. At the same time, Navteq captures a total geocoded landscape through integrated GPS.

What are the differences between these practices? Both can be called capture. Navteq uses capture to produce the GIS behind Google Maps; Google Maps is in turn the technology underlying Foundcity; and Foundcity uses folksonomy to place local users' captured information back onto Google / Navteq maps. In this light, to what extent does Navteq's capturing gps geocoordinates differ from individual Foundcity users' tagging maps with natural language addresses—particularly if those addresses will be converted through the Google Maps API into geocoordinates? What if any difference exists between captured satellite images and captured cell phone images? While it is increasingly difficult to draw conclusive boundaries amidst incongruent technological ambitions and cultural perspectives, glocal mapping practices emerged in this complexity, and negotiated it.

CONCLUSIONS: ON MAPPING GLOCALITIES

The three case studies examined here show how emergent online mapping accessed the local through the personal, although in each case the personal and local were mobilized to different ends. For Google, which mapped data obtained from its *index*, and for map hacks and mashups, which mapped data acquired from other online sources, the *personal is geographic* (as in a geocoded personal clickstream) and the *local is informatic* (as in using the geocoded attribute of that clickstream as a criterion for delimiting the relevance of data). For folksonomy-based mapping, which acquires data from the *field*, the *local is geographic* (as in the neighborhood in which local data is encountered) and the personal is informatic (as in the processes of selecting, sampling, digitizing, and annotating neighborhood data to make it personally relevant and resonant). In either case, online mapping appeared culturally as a key component to orienting us to an informational world. Early online maps served as the link between *searching* for the "world's information" and *processing* our own localities as information.

While in many ways disparate, these projects are unified by their hybridized, glocal approaches to mapping. Discussing glocalization in the context of Web 2.0, Boyd suggests that an informatic, network model for understanding the world should replace a geographic model:

> *Rather than conceptualizing the world in geographical terms, it is now necessary to use a networked model, to understand the interrelations between people and culture, to think about localizing in terms of social structures not in terms of location.*[101]

From a technical standpoint, online mapping engages with many of the Web 2.0 practices boyd describes. I concur with her stance that glocal awareness emerges in the wake of information retrieval failures in the first-generation Internet's globalization of economic and communications networks. However, in differentiating between a first-generation "global village" idea of technology's transcending geographic location, and a second-generation glocalized view in which technologies like folksonomy localize cultural values, boyd maintains an opposition between network technology on one hand and geography on the other: a distinction that is between *information* and *territories*. In both of boyd's narratives, technology acts upon and structures a comparatively passive geographic substrate, and in the process redistributes a culture that has been divorced from geography. But in glocalization, culture is the mutual entanglement of geographies and networks. In mapping glocalities, it is the combination of information mapping and territorial mapping. Online mapping shows that the geographic is inseparable from networked identity and cultural relativity. In online mapping the cultural is at once geographic and informatic, both performed and constructed as such by interwoven human and technological systems.

Thus, online mapping captures glocality. Our three case studies have illustrated how it does so, in the first place, through techniques of capture that interpolate local movements within a global system. These techniques include the capture of clickstreams from local search queries, the capture of geo-coded information from existent online data sources in map hacks and mashups, and the capture of local, personal annotations in folksonomy-based neighborhood mapping. We have considered the informatic principles and technological means by which capture practices are supported within contingent, relational, generalizing systems, and how these principles differ in kind from, but are built upon, prior surveillance practices.

Additionally, this project has sought to show how technologies are engineered to serve overt political ends. Mapping technologies in particular are noteworthy in this respect because, more than others, they assert the ability to neutrally represent the world.[102] Nonetheless, notwithstanding this assertion, they shape and structure the geographic and cultural territories they depict. Scanning panoramic satellite camera lenses (discussed in Part One) impart one form of distortion; clustering algorithms in folksonomies or geodemographics impart another; and hierarchical classification ontologies and search algorithms impart still more. There is always an intimate involvement between "the world as information" and the technologies which claim to find that it is such.

In this way, online mapping captures glocality in a second sense of the word, in that to capture something means also to convey its essence. In the case of online mapping, capturing glocality means to represent people's relationships to the world as a hybridization of local and global contextualizations.

BIOGRAPHY

Katherine Behar is an internationally exhibited interdisciplinary artist who lives and works in New York City. She has an abiding interest in the permeability between living and non-living systems. Behar has taught on the faculties of the Department of Film and Media Studies at Hunter College and the department of Film, Video and New Media at the School of the Art Institute of Chicago.

NOTES:

1 My special thanks to Alex Galloway for his guidance during my studies at the Media Ecology Program at New York University, where this project originated. On how technological and social Internet principles and mores can be distinguished from dotcom era Web trends, see Tim O'Reilly's account, "What is Web 2.0: Design patterns and Business Models for the Next Generation of Software," http://www.oreillynet.com/lpt/a/6228.

2 Katherine Behar, "Capturing Glocality—Online Mapping Circa 2005: Mapping Territories," *Parsons Journal for Information Mapping* 1, no. 1 (January, 2009).

3 Philip E. Agre, "Surveillance and Capture: Two Models of Privacy," in The New Media Reader, ed. Noah Wardrip-Fruin and Nick Montfort (Cambridge: MIT Press, 2003) 737–760.

4 Danah Boyd, "Why Web 2.0 Matters: Preparing for Glocalization," http://www.zephoria.org/thoughts/archives/2005/09/05/why_web20_matte.html.

5 Google's mission statement, discussed in detail in Part One, is "to organize the world's information and make it universally accessible and useful." Google, "Corporate Information: Company Overview," http://www.google.com/intl/en/corporate/index.html. See also Behar, "Mapping Territories."

6 There are a number of ways to classify the technologies I am discussing as information maps. In maintaining the distinction between directories and search engines generally, this schema is consistent with the classification offered by Sherman and Price, while departing from others such as those offered by authors Introna and Nissenbaum, who distinguish between spider- and directory-based search engines, and by authors Aharoni, Frank, and Shoham, who distinguish between crawl-based, directory-based, and meta-search engines. While users may "look for something" or, colloquially, "search" at a directory, a directory is not a search *engine*. Moreover, search engine technologies definitionally contain crawls. A categorization that considers a directory a form of search engine risks obscuring the relationship between technologies and brands, a subject addressed by Eszter Hargittai. For example, Yahoo!, a portal company, offers a directory but this feature is distinct from its search, which until 2004 operated on Google's search engine.

See Chris Sherman and Gary Price, *The Invisible Web: Uncovering Information Sources Search Engines Can't See*, (Medford: CyberAge Books, 2001); Lucas D. Introna and Helen Nissenbaum, "Shaping the Web: Why the Politics of Search Engines Matters," *The Information Society* 16, no 3. (2000): 169–185; Yaffa Aharoni, Ariel J. Frank and Snunith Shoham, "Finding information on the free World Wide Web: A specialty meta—search engine for the academic community," *First Monday* 10, no. 12 (December 2005); Eszter Hargittai, "Do you 'google'? Understanding search engine use beyond the hype," *First Monday* 9, no. 3 (March 2004).

7 John Battelle, *The Search: How Google and Its Rivals Rewrote the Rules of Business and Transformed Our Culture* (New York: Penguin Group, 2005) 45.

8 Ibid., 39–40.

9 Sherman and Price, The Invisible Web, 5–6.

10 Battelle, The Search, 46.

11 Ibid., 53.

12 The logic of the web portal economy pivots on retaining users at the portal site for as long as possible in order to maximize their exposure to advertising. See discussion in Battelle, *The Search*, 84.

13 For a company history of Yahoo! see Karen Angel, *Inside Yahoo!: Innovation and the Road Ahead* (New York: John Wiley and Sons, 2002).

14 Yahoo! Press Room, "Yahoo! Inc. - Company History: How It All Started…," http://yhoo.client.shareholder.com/press/history.cfm.

15 Ibid.

16 Yahoo! Press Room, "Frequently Asked Questions," http://yhoo.client.shareholder.com/press/faq.cfm.

17 Battelle, The Search, 61.

18 With respect to directories, the authors focus on opaque editorial policies which are perceived to be inconsistently applied by human decision-makers who ultimately determine the contents of the directory: "For directory-based search engines, therefore, human gatekeepers hold the key to inclusion in their indexed databases." See Introna and Nissenbaum, "Shaping the Web," 171.

19 See Shirky's treatment of the subject in Clay Shirky, "Ontology is Overrated—Categories, Links, and Tags," Spring, 2005, http://www.shirky.com/writings/ontology_overrated.html. I would further distinguish between Yahoo!'s initial directory and the complexities of its current multifaceted enterprise, not all of which is hierarchical.

20 Please refer to Part One of this project for additional discussion of Google's practices. See Behar, "Mapping Territories."

21 Battelle, The Search, 69–71.

22 Ibid, 69.

23 Ibid, 74.

24 At the same time as Page was developing BackRub, Jon Kleinberg was conducting similar research in developing his hits algorithm at the ibm Almaden Research Center in San Jose. Kleinberg and Page shared, and mutually cited, each other's work. See Jon Kleinberg, "Authoritative sources in a hyperlinked environment," *Proceedings of the 9th Annual ACM-SIAM Symposium on Discrete Algorithms*, (New York: ACM Press, 1998) 668–677.

25 Lawrence Page, Sergey Brin, Rajeev Motwani, Terry Winograd, "The PageRank Citation Ranking: Bringing Order to the Web," Stanford University Technical Report, (January 29, 1998), 8.

26 Sergey Brin and Lawrence Page, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," www7 / *Computer Networks,* 30, no. 1–7 (1998): 107–117.

27 Stuart Hall and others contest this position. Hall notes that every communication system will always contain cultural (i.e., human) influence — even those systems which seem most "purely" technological. In Hall's view, not only does "human expertise" factor into the various choices and preferences that go into encoding Google's algorithm, but the activities of interpretation and evaluation, which together constitute its decoding, are entirely dependent on human judgment. In the case of search engines, the "relevance" determination that is retroactively applied to algorithms' information retrieval capabilities is the key to this human involvement. *Ultimately, relevance* *concerns meaning, something that Google's ambition to divorce itself from human involvement claims to disregard.* See Stuart Hall, "Encoding/decoding," *Culture, Media, Language*, Stuart Hall, ed. (New York: Routledge, 1992). Scholars Lucas Introna and Helen Nissenbaum further this point by calling attention to the encoded bias in search engines. See Introna and Nissenbaum, "Shaping the Web."

28 Brin and Page, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," n.p.

29 Shirky, "Ontology is Overrated — Categories, Links, and Tags," n.p.

30 Introna and Nissenbaum, "Shaping the Web," 171.

31 This is, in fact, precisely the goal motivating Tim Berners-Lee's Semantic Web project. The Semantic Web is another second-generation classification system; however, it works in an opposite manner from folksonomy. Where folksonomy embodies flexibility and change through post hoc classification, the Semantic Web assigns unique, absolute identifiers a priori to all parts of the system.

32 Clickstreams are records containing information of individual users' Internet activity, during a visit to one or more websites. Clickstreams collect information passively provided by the user pertaining to the sequence of pages visited, the duration of time spent at each page, which links the user selected as means of navigating between pages, and the user's IP address, as well as any information which the user may provide actively through web forms, etc. The latter applies to text entry fields used for entering search terms.

33 Brin and Page, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," n.p.

34 There is debate over the best terminology to describe the practices I refer to as folksonomy. Some prefer to use "cooperative classification" or "collaborative tagging" in lieu of folksonomy because they feel that the latter improperly privileges taxonomy. Golder and Huberman, who choose the term "collaborative tagging," further distinguish between Delicious and Flickr on the grounds that, while Delicious is an example of collaborative tagging, Flickr is only social insofar as users can see each other's content; however, users can only tag their own content. Therefore, they argue, Flickr is not an example of *collaborative* tagging. While their rationale is correct, I have chosen to use the term "folksonomy" throughout to indicate a variety of social tagging practices. "Folksonomy" is a more inclusive and more colloquially understood term, and underscores how "tagging" is taxonomic organization. See Adam Mathes, "Folksonomies—Cooperative Classification and Communication Through Shared Metadata," http://www.adammathes.com/academic/computer-mediated-communication/folksonomies.html (accessed September 24, 2009); Scott A. Golder and Bernardo A. Huberman, "The Structure of Collaborative Tagging Systems," Information Dynamics Lab, HP Labs, http://www.hpl.hp.com/research/idl/papers/tags/tags.pdf.

35 Peter Merholz, "Ethnoclassification and vernacular vocabularies," http://www.peterme.com/archives/000387.html.

36 Adam Mathes, "Folksonomies—Cooperative Classification and Communication Through Shared Metadata," n.p.

37 Ibid., n.p.

38 Ibid., n.p.

39 Matteo Matteucci, "A Tutorial on Clustering Algorithms," http://home.dei.polimi.it/matteucc/Clustering/tutorial_html/index.html.

40 In fact, use of clustering by the first-generation search engine Excite was reported as early as 1998. Steve Lawrence and C. Giles, "Searching the World Wide Web," *Science, New Series*, 280, no. 5360 (April 3, 1998): 98–100.

41 Clusty and Vivísimo are properly metasearch engines because they run searches on other search engines' searches. For example, Clusty offers the ability to cluster search results according to the search engine through which they were returned. See *Clusty*, http://clusty.com/; Vivísimo, http://vivisimo.com/.

42 Clay Shirky, "Folksonomy is Better for Cultural Values: A Response to Danah," http://www.corante.com/many/archives/2005/01/29/folksonomy_is_better_for_cultural_values_a_response_to_danah.php.

43 Danah Boyd, "Issues of Culture in Ethnoclassification/Folksonomy," http://www.corante.com/many/archives/2005/01/28/issues_of_culture_in_ethnoclassificationfolksonomy.php.

44 Ibid.

45 Further discussion on this point lies beyond the scope of this paper. However, see Bowker and Leigh Star's insightful treatment of the cultural impacts of classification in Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and its Consequences* (Cambridge: MIT Press, 1999).

46 Delicious, "Popular Bookmarks on Delicious," http://del.icio.us/popular.

47 Google, "Google Press Center: Zeitgeist," http://www.google.com/press/zeitgeist.html.

48 Ibid.

49 Shirky, "Ontology is Overrated," n.p. In particular, see section "Tag Distributions on delicious" See also John Fraim's discusssion of the value of "watching words" for cultural insights in his "Electric Symbols: Internet Words and Culture," *First Monday*, 7, no. 6 (June 2002).

50 Ortho-pixels are geo-referenced pixels; the innovations surrounding ortho-pixels are discussed in depth in Part One of this project. Behar, "Mapping Territories."

51 Google Earth is a "three-dimensional" GIS and search product that "combines satellite imagery, maps and the power of Google Search to put the world's geographic information at your fingertips." A similar product, MSN Virtual Earth, was released by Microsoft in July, 2005, a month after Google Earth's release. Mimicking the amalgamation of Google Maps and Local Search, MSN Virtual Earth was renamed Windows Live Local on December 8, 2005, and with new features, Microsoft rebranded the product as Bing Maps for Enterprise on June 3, 2009. A discussion of Google Earth and Bing Maps is beyond the scope of this paper. *Google Earth*, http://earth.google.com/; *Bing Maps*, http://www.bing.com/maps/; Juan Carlos Perez, "Virtual Earth Becomes Windows Live Local: Microsoft mapping service to provide higher quality images than Virtual Earth's," http://www.pcworld.com/news/article/0,aid,123847,00.asp; Richard Marsden, "Virtual Earth rebranded as 'Bing Maps for Enterprise,'" http://www.geowebguru.com/news/147-virtual-earth-rebranded-as-qbing-maps-for-enterpriseq.

52 In fact, Google Earth was publicly released to coincide with a germane indicator of the mounting trend in online mapping: technology publisher O'Reilly's "Where 2.0" conference, of which Google was also a conference sponsor. Where 2.0 was held to discuss "a whole new class of web apps and services" based on "[l]ocation-aware technologies combined with mapping and other data." Where 2.0: A New Direction for Technology, http://conferences.oreillynet.com/where2005/.

53 Google, "Back on the map," http://googleblog.blogspot.com/2006/04/back-on-map.html.

54 Google, in announcing the second name change, explains how by 2006, Maps/Local was already integrated in standard search practices: "Does this mean that local search is no longer important to Google? Absolutely not! Google Maps continues to have the killer combination of maps, driving directions, and local business search. And local search has become a fundamental part of the Google search experience; it's now embedded within a number of our products, including Google web search, Google Earth, Google SMS, and Google Mobile." *Google*, "Back on the map."

55 I am concerned here with way that the interface's apparent allocation of control inflects the user experience in the core map application. An analogous user experience is similarly conveyed to another class of users, programmers, at another class of interface, the API. For a related discussion of how control is apportioned by APIs, see William Blaze, "Web 2.0" http://www.abstractdynamics.org/archives/2005/08/27/web_20.html.

56 At the time of writing, Google Maps views have expanded considerably to include Traffic, Street View, Terrain, user-contributed photos and videos, webcams, and location relevant Wikipedia articles, all of which work on the principle of data layers inherent in GIS and discussed in detail in Part One. Behar, "Mapping Territories."

57 Nathan Torkington, "Google maps and Their Data Providers," O'Reilly Radar, October 11, 2005, http://radar.oreilly.com/archives/2005/10/google_maps_and_their_data_pro_1.html (accessed September 24, 2009). For a discussion of Navteq, see Part One of this project in Behar, "Mapping Territories."

58 Matt Hines, "Google buys satellite image firm Keyhole," http://news.com.com/2100-1032_3-5428685.html.

59 Bill Kilday, "Cover the Earth," http://googleblog.blogspot.com/2005/06/cover-earth.html.

60 Google's satellite imagery evokes its historical roots in military surveillance and reconnaissance, discussed in Part One in the context of Cold War remote sensing. Because this type of photography has legal testimonial value when used as criminal evidence, and because machinic optics are conventionally accepted as being free from affective distortions, the camera's empirical view is culturally alleged to possess irrefutable truth-value. By way of comparison, the *non-optical* perspective offered by Map View is the perspective of an *analytical machine*: a statistical processor. Because capture, its representational technique, is non-optical, its imagery bears no indexical relation to its referent. As a result, it is extremely difficult to make judgments about the veracity of the representation in Map View.

61 Local searchability has been of continual interest to Google. For example, as early as 1998, Page and Brin wrote: "We also plan to support user context (like the user's location)[...]." Four years later, the winning entry of Google's 2002 Programming Contest was Daniel Egnor's "Geographic Search" project. Much like the functionality now provided by Local/Maps, "Geographic Search" matched natural language address strings with geo-coordinates. The full project description as listed on Google's website is: "Daniel's project adds the ability to search for web pages within a particular geographic locale to traditional keyword searching. To accomplish this, Daniel converted street addresses found within a large corpus of documents to latitude-longitude-based coordinates using the freely available TIGER and FIPS data sources, and built a two-dimensional index of these coordinates. Daniel's system provides an interface that allows the user to augment a keyword search with the ability to restrict matches to within a certain radius of a specified address (useful for queries that are difficult to answer using just keyword searching, such as "find me all bookstores near my house"). We selected Daniel's project because it combined an interesting and useful idea with a clean and robust implementation." As noted in Part One, TIGER is the census database system attributed with commercially popularizing GIS. See "Future Work" in Brin and Page "The Anatomy of a Search Engine," n.p.; Google, "2002 Google Programming Contest Winner" http://www.google.com/programming-contest/winner.html.

62 Matthew Hicks, "Google Dives into Local Search," http://www.eweek.com/article2/0,1895,1550320,00.asp.

63 Curry describes the multiple aspects of "switching" involved in GIS: embodying multiple viewing positions, as well as "switch[ing ...] from a purely conceptual relationship with [a] model [...] imagin[ed] as a conceptual object outside of [the perceiver], to one that has a visual existence, and to one that projects around [the perceiver] that representational barrage [of a virtual fly-through] that seems to transform it....", and lastly, a form of switching related to conceiving of situated intertextualities. Michael R. Curry, Digital Places: *Living with Geographic Information Technologies* (New York: Routledge, 1998), 33–38.

64 See John Battelle's insightful discussion in *The Search*.

65 Battelle calls this information "the database of intents," an ideal database that stores human desire.

66 O'Reilly, "What is Web 2.0?" 3.

67 *TrueLocal*, http://www.truelocal.com/.

68 The term "mashup" is derived from the DJ technique of mixing dissimilar music tracks to create a new track in which the components maintain their integrity.

69 *Fundrace,* http://www.fundrace.org/; http://fundrace.huffingtonpost.com/moneymap.php.

70 Summarizing these goals in its privacy statement, Fundrace writes: "In an effort to further transparency and political accountability, FundRace.org provides an interface to help the general public understand these public records." Fundrace, "Privacy Statement," http://fundrace.huffingtonpost.com/privacy.php.

71 *Mobiledia Cell Phone Tower Search*, http://www.cellreception.com/towers/index.html.

72 *ATMLocator*, http://www.locateatms.com/ (At the time of writing, this site is no longer online).

73 *Alkemis Local Live Traffic Cams*, http://local.alkemis.com/. (At the time of writing, this site has been transformed into a complex mashup called "Alkemis Local.")

74 *Dartmaps (Beta)*, http://www.mackers.com/projects/dartmaps/. (At the time of writing, this site is no longer being maintained and exists only as a reference page.)

75 *HYDESim*, http://meyerweb.com/eric/tools/gmap/hydesim.html.

76 *Hurricane Information Maps*, http://www.scipionus.com/. (At the time of writing, this site is no longer online.)

77 *HotOrNot + Google Maps*, http://hotmaps.frozenbear.com/. (At the time of writing, this site is no longer online.)

78 *Placeopedia*, http://www.placeopedia.com/. (At the time of writing, a similar feature has now been integrated as a Wikipedia data layer within the Google Maps interface.)

79 *UFO Maps*, http://www.ufomaps.com/.

80 Unfortunately, as the result of legal action from Hasbro, the makers of Risk, this project was online only briefly. See: http://www.ashotoforangejuice.com/gmrisk.html.

81 These projects have received accolades in both blogs and traditional media. See, for example Pamela Licalzi O'Connell "Do-It-Yourself Cartography" *The New York Times*, December 11, 2005, http://www.nytimes.com/2005/12/11/magazine/11ideas1-13.html?ex=1136091600&en=ae370438791cd2e4&ei=5070.

82 *Chicago Crime Database*, http://www.chicagocrime.org/.

83 *HousingMaps*, http://www.housingmaps.com/.

84 *MapSexOffenders: Free Nation-wide Sex Offender Mapping (Beta)*, http://www.mapsexoffenders.com/. (At the time of writing, this site has been transformed into a pay service.)

85 *Craigslist*, http://craigslist.org/.

86 The Olsen brothers' story is related in Andy Sullivan, "'Mashups' Find Potholes and Sex Offenders" Reuters, August 27, 2005, http://www.pcmag.com/article2/0,1895,1853145,00.asp.

87 *Gmaps Pedometer*, www.gmap-pedometer.com/.

88 *Zip Code Boundary Map, 3 Digit Zip Code Boundary Map, Town/City Boundary Map, County Boundary Map, and Core Based Statistical Area (FIPSCSA) Boundary Map*, http://maps.huge.info/.

89 Clay Shirky, "Situated Software," http://www.shirky.com/writings/situated_software.html.

90 *Flickr Memory Maps*, http://www.flickr.com/photos/tags/memorymap/.

91 Flickr, http://www.flickr.com/.

92 mathowie, "My childhood, seen by Google Maps," http://www.flickr.com/photos/mathowie/8496262/.

93 mathowie's use of Flickr to compensate for Google's lack of an annotation feature evinces a mashup sensibility. More recently, in a gesture fully in keeping with glocalization's capacity for globally formalizing local detournements, Google Maps added capability for uploading and annotating photos (also similar to Foundcity discussed below).

94 See Golder and Huberman, "The Structure of Collaborative Tagging Systems," n.p.

95 Whereyouare, http://www.whereyouare.org/.

96 Ibid.

97 Ibid.

98 Jane Jacobs, *The Death and Life of Great American Cities* (New York: Vintage Books, 1992).

99 *Foundcity*, http://www.foundcity.net/. (At the time of writing, this site is no longer online.)

100 Foundcity, "Foundcity FAQ," http://www.foundcity.net/faq.php#help_website. (At the time of writing, this site is no longer online.)

101 Boyd, "Why Web 2.0 Matters: Preparing for Glocalization," n.p.

102 See Irit Rogoff, *Terra Infirma: Geography's Visual Culture*, (New York: Routledge, 2000). See also Curry, *Digital Places* and Pickles, ed., *Ground Truth*.

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