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The creative reconstruction of the Internet: Google and the privatization of cyberspace and DigiPlace

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Abstract

The Internet has often been portrayed as the ultimate leveler of information where existing hierarchies of power and privilege are undermined by meritocracy. Some websites and functions are, however, more equal than others. In particular, search engines such as Google have been a key means to construct meaning out of disorder. This ordering (or enclosing of the Internet commons), however, comes at a cost as a location within the top 10 Google search results, marks the boundary (albeit a fluid one) between the core and the periphery of the Internet. The recent incorporation of spatial elements into the Google indexing raises fresh and geographically relevant concerns. This article focuses on the construction, access and use of Google derived rankings to deploy geo-referenced information in the physical environment and the way this melding of code and place affects how people interact with place. Using the theoretical concept of DigiPlace this article analyzes how Google Maps and Google Earth are structured and shape what appears (and what does not) in cyberspace and DigiPlace. Of particular concern are the implications of a private corporation controlling this new space.

Keywords: Online mapping; Google; Code; Cyberspace; Critical cartography; Hybrid space; DigiPlace; Public space

1. Introduction

> "The perfect search engine … would understand exactly what you mean and give back exactly what you want" – Google co-founder Larry Page (Google, 2006b)

The Internet has often been portrayed as the ultimate leveler of information where existing hierarchies of power and privilege are undermined by meritocracy. Words, not pedigree, determine the value of an interaction, comment or website (Steiner, 1993). This vision, however flawed, remains compelling, particularly when deciding how to negotiate through a seemingly infinite set of choices available on this network of networks. The distributed nature of the Internet makes high quality "search" essential, and search engines have been a key avenue in constructing meaningful experience out of disorder. Although this ordering is based on socially constructed software and databases, it is essential to the operators of search engines that users perceive the resulting structure as a *natural* outcome of a *rational* process that produces *unbiased* results (Introna and Nissenbaum, 2000). Otherwise, users would likely seek other avenues for access.

A key actor within this naturalization of search is Google, the most recent (and most successful) of efforts to bring order to the chaos of the Internet. This indexing (or enclosing of the Internet commons), however, comes at a cost. Although all Internet resources remain "equally" accessible in theory, a location within the top 10 Google search results, marks the boundary (albeit a fluid one) between the core and the periphery of the Internet (Jansena et al., 2000). Moreover, while there is no denying it is an incredibly useful tool, the Google index and its suite of applications are the products (and under the complete control) of a private for-profit corporation. This private and

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opaque control over the definitive index and search engine for the Internet is the first topic of this article (see also Vaidhyanathan, 2005).

The introduction of the Google Maps and Google Earth technologies raises fresh and geographically relevant concerns about Google's ranking algorithms. Although only recently introduced, these services have the potential of being the "killer apps" of geo-referenced data as they are adopted by users worldwide. This article focuses specifically on the construction, access and use of these Google technologies to rank and map information about physical places.[1] Particularly compelling are the ways in which new hybrid spaces (built through the dynamic melding of code, data and material place) affect how people live and the extent to which these spaces are understood and shaped in non-transparent ways. Building upon a theoretical review of code, space and place, the concept of DigiPlace is introduced as a heuristic for the cartographies that result from the melding of data located and ranked in cyberspace with people's understanding and use of physical places.

Like all cartographies, however, DigiPlace abstracts from reality in its representations of the material world (Harley, 1988; Monmonier, 1996) and it is the nature and structure of these distortions that is explored here. The article uses the results obtained from Google Maps and Google Earth searches to illustrate how DigiPlace is formed and how it can affect the use of physical places. This study is not intended to be comprehensive, nor is it meant to be a detailed analysis of each topic introduced in this article. Instead, by reviewing a range of issues associated with DigiPlace, this article highlights how the digital and the material are increasingly combined in the daily lived geographies of the 21st century.

2. Enclosing the cyberspace commons

> "Don't do evil" – Google Corporate ethos (Harmon, 2004)

The Internet has been lauded by commentators as a paragon of democratic decentralized difference, freed from the grand narratives which suppressed dissent in earlier times (Thu Nguyen and Alexander, 1996; Emberley, 1988; Warf and Grimes, 1997; Poster, 1995). In this view the Internet represents a "knowledge commons" (Hess and Ostrom, 2006) in which information flows from node to node, and any blocks, censures, or attempts at presenting essentialized knowledge or propaganda can easily be circumvented. In short, the Internet has no center as it is by definition a network of networks.

This notion, however, is belied by the fact that the Internet is not some purely randomized network in which all nodes have a relatively equal position. Instead it is best described as a scale-free network in which a small proportion of nodes function as highly connected hubs while the much larger group of remaining nodes have a relatively low degree of integration into and influence over the network. This means that while Internet users can in theory circumnavigate any and all discourses they encounter, they are highly likely to utilize hubs, *e.g.*, search engines that have enclosed the Internet via their ranking and indexing methodology. To be sure, this enclosure does not represent a clear-cut boundary akin to a fence around a field, but is more analogous to the fuzzy boundaries associated with academic disciplines. Search engine indexes are filters or tendencies that can be thwarted, but only if an individual recognizes the enclosure and seeks to circumvent it rather than remaining comfortably ensconced within it.[2]

This enclosure of information by hubs means that they have disproportionate sway over what is encountered and what is marginalized (Barabási and Albert, 1999; Dodge and Kitchin, 2001; Castells, 1996) and represents the power of knowledge within a network of social relations (Foucault, 1972, 1980). Thus, despite broad technological, epistemological and rhetorical shifts towards decentralization, the Internet also incorporates hierarchical power structures, albeit ones in which the specific actors and actions are continuously evolving. Chief among these is Google and its proprietary ranking algorithm, PageRank, which automatically produces the space of Google rankings (Thrift and French, 2002) based on the socio-cultural makeup of Internet linkages.

PageRank was modeled after academic citation literature as an objective means to measure the worth of a webpage, *i.e.*, it assumes that the number of hyperlinks to a webpage provide some indication of the importance or quality of that page (Brin and Page, 1998). The system "interprets a link from page A to page B as a vote, by page A, for page B" (Google, 2006c). But, Google looks at more than the sheer volume of votes, or links a page receives; it also analyzes the page that casts the vote. "Votes cast by pages that are themselves "important" weigh more heavily and help to make other pages important" (Google, 2006c).

The creators of Google initially intended PageRank to be an unbiased measure of worth, free from commercial bias. Indeed they even boast that "PageRanks are virtually immune to manipulation by commercial interests" (Page et al., 1998, p. 12). Google, however, has since recognized vulnerabilities inherent to the system. Efforts by

[1] Google is certainly not the only company to see an opportunity in geodata as competing services are being developed by Yahoo! and Microsoft. This article concentrates exclusively on Google both to focus the analysis and because the authors perceive that Google is currently the leader in this industry. The analysis herein, however, could be readily and easily extended to the entirety of this emerging industry of geo-coded information services rather than simply representing one specific software interface or company.

[2] This filtering, however, does not take away from the fact that some type of indexing is absolutely essential for searching the Internet. Moreover, search engines allow people to access the "long tail" of niche markets or marginalized interests (be they liberating or reactionary), providing them with hitherto unimaginable visibility (Anderson, 2006).

webmasters (*e.g.*, search engine optimization) to influence their PageRank to appear higher in Google's index (Seda, 2004) have resulted in an arms race of sorts with Google introducing other measures and metrics to inhibit conscious efforts to manipulate PageRank. Nevertheless a spot in Google's top 10 search results is a coveted and sought after position given that the majority of Internet searchers do not access more than the first page of results (Jansena et al., 2000).

Consequently Google is very circumspect about the methodology it uses to rank websites. A page provided by Google explaining its rankings simply states, "Google's order of results is automatically determined by more than 100 factors, including our PageRank algorithm ... Due to the nature of our business and our interest in protecting the integrity of our search results, we limit the information we make available to the public about our ranking system" (Google, 2005). The statement that over "100 factors" go into the determination of rankings highlights the complexity of the process. It is precisely this complexity that necessitates the automatic production of the space of Google rankings. While the composition of the weights, measures

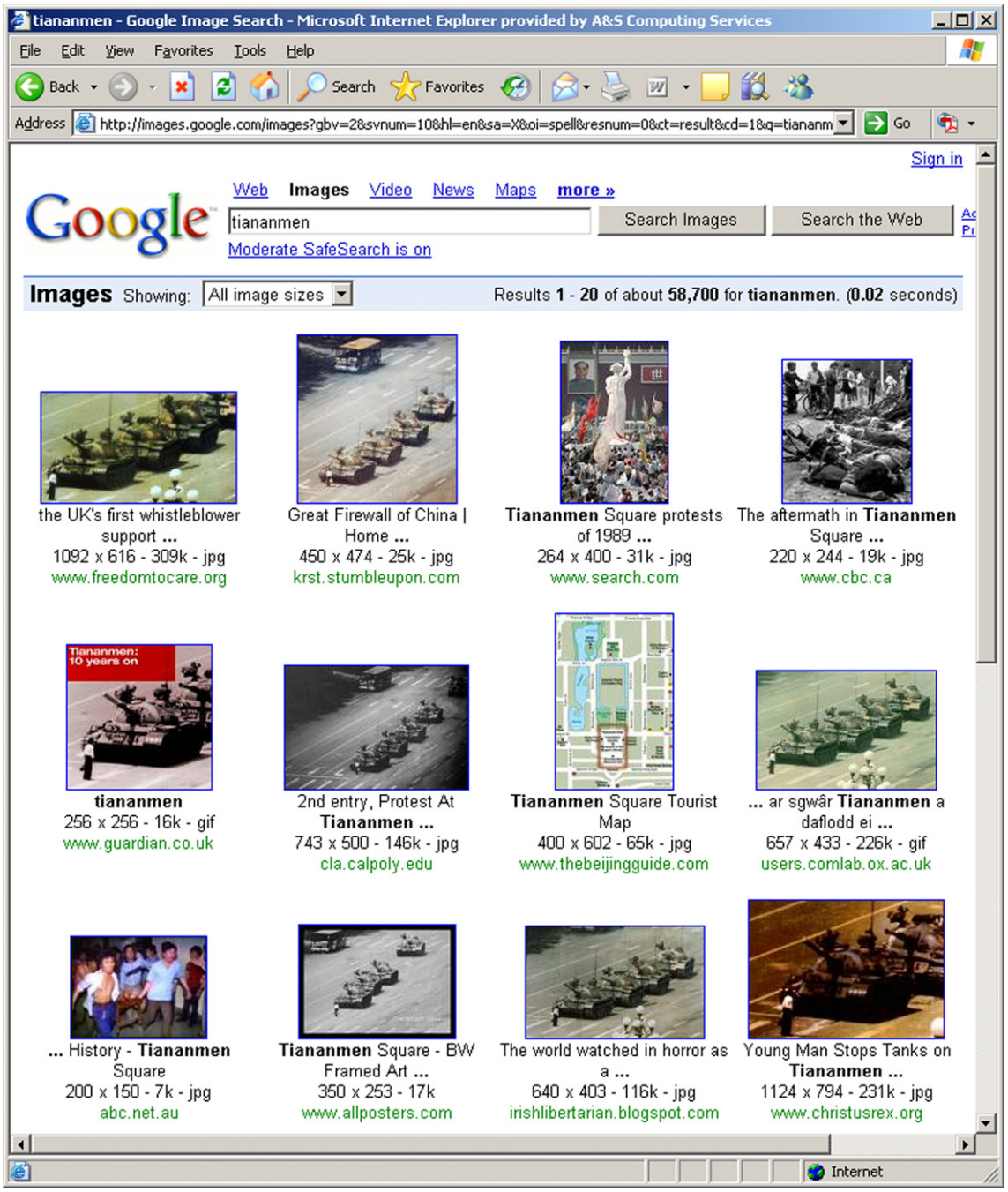

Fig. 1. Results of image search on keyword "Tiananmen". *Source:* Authors' photo on March 23, 2007.

Fig. 1 (*continued*)

and criteria used are artificially constructed and constantly revised, Google attempts to "naturalize" its results as an objective representation of the Internet.

Fundamentally, however, one cannot escape the shading that is an inherent process of ranking; but because Google's algorithms are proprietary, the public is unable to look inside the "black box". Instead they are urged to accept these results as unbiased and rational. For example, at the bottom of Google's News index (news.google.com) one finds the disclaimer, "The selection and placement of stories on this page were determined automatically by a computer program." While no doubt intended to be reassuring of the objectivity of Google, it provides an unintentional indication of the power of code (Lessig, 1999) to shape the access and ordering of information. And precisely because ranking is based on code, it is subject to manipulation by its owner/coder.

An excellent example of the ease in which Google can alter its ranking algorithm and shape representation involves the results from a simple Google image search. In a controversial move Google bowed to the demands of the Chinese government and agreed to filter the results of

searches (Watts, 2006). Fig. 1 provides a telling illustration of how different results can be when one searches for images using the term "Tiananmen". The results from Google.com shows images from the pro-democracy protests of 1989 while those from Google.cn (the only interface to Google available in China) show a series of smiling people and buildings.[3] Google has literally enclosed different sections of the Internet and marginalized knowledge that was deemed undesirable by the Chinese government.

The overt differences between results in this example are stunning as they are the product of a conscious effort to shape cyberspace and belie Google's characterization of its rankings as a *natural* outcome of a *rational* process that produces *unbiased* results. This is not to devalue the usefulness of bringing order and ranking to the Internet but to recognize that it is a socially constructed process subject to direct manipulation. As Mitchell (1996, 112) argues "... control of code is power ... Who shall write the software that increasingly structures our daily lives? What shall that software allow and proscribe? Who shall be privileged by it and who marginalized? How shall the writers of the rules be answerable?"

The obvious manipulations of code, however, are the ones that are most easily recognized and circumvented. Of greater concern, is the automatic production of space through pre-determined and proprietary algorithmic procedures that proceed without the overt intervention of humans. Google's mapping products, Google Maps and Google Earth, represents a compelling case of how this automatic production of digital space (via private and opaque code) is shaping the way in which physical places are perceived and experienced.

3. The production of DigiPlace

> "Software, commonly referred to as code, is increasingly central to the spatial formation of collective life..." (Dodge and Kitchin, 2005, p. 162)

Google's recently introduced mapping services, Google Maps and Google Earth, combine its index of cyberspace with easy to use and powerful mapping technology.[4] Google Maps is a web-based interface accessible via browser technology that allows for spatially referenced queries on Google's index of cyberspace. Google Earth is a stand alone piece of software that duplicates the search function of Google Maps and also provides access to a number of additional data layers such as user generated annotations, *i.e.*, geo-referenced comments or photographs referred to as placemarks. Fig. 2 shows the results of identical searches for hotels near the Los Angeles International airport through the two Google interfaces.

While online mapping programs such as MapQuest have been popular for some time, the uses of these services were relatively limited, *i.e.*, largely employed to generate directions between two known addresses. In contrast, Google's mapping services combine simple yet powerful user interfaces, satellite imagery, local search function and fast-loading maps; a combination and refinement of incremental innovations that make online mapping much more accessible to a wide range of people. Moreover, Google Maps and Google Earth provide the means for the individual exploration of geographic space ranging from searching for nearby pizza restaurants to identifying the location of bombings in downtown Baghdad.

A particularly innovative feature is the ability for people to create and change the digital world in which they are immersed by adding, sharing and accessing user generated overlays and placemarks. The fluid nature of Google's index and users' postings means that maps and views appear to be constantly open, shifting and changing, seemingly defying any sort of fixed meanings. Underlying this fluidity, however, are the software algorithms, *i.e.*, code, behind Google's mapping services and the policies of a for-profit corporation that determine the possible and the prohibited.

Dodge and Kitchin (2004, 2005), construct a related typology of three ways in which code joins the physical and the virtual: 'code/space', 'coded space', and 'background coded space'. Code/space (*e.g.*, ATMs or automatic ticket machines) is described as an environment in which code is the dominant actor in producing space and where a failure in code results in the disruption of these spaces. Coded space (*e.g.*, traffic information signs) are spaces in which a failure of code results in a loss of function rather than complete failure, *i.e.*, the space can still be used but not as it had been augmented by code to be used. The final type, background coded space, reflects a dormant space that can be accessed (*e.g.*, placing a mobile phone call) and in so doing changes the space into code/space or coded space. In short, it is a space of potential.

While this typology is useful, it focuses primarily on digital code that is physically embedded in the environment such as the relatively stable programs of financial institutions (ATMs), governments (ticket machines and highway signs) or telecommunications companies (mobile phones). In contrast, the electronic code and data used by Google is not likely to be rooted in the physical place it impacts. Nevertheless, it can deeply affect perceptions of material places and the way in which one uses and interacts with them. This article characterizes such mixing of code, data and physical place as 'DigiPlace', *i.e.*, the use of data that is ranked in cyberspace to create dynamic

[3] It is important to note that the filtering of objectionable images is not full proof. While the search did not reveal any pro-democracy images on the first page of results, two did appear in the second page. Moreover, misspellings such as "Tianamen" resulted in pro-democracy images in the first page of results. Nevertheless, these images are clearly on the periphery of Google.cn space.

[4] Google Maps was introduced in February 2005 and was originally termed Google Local but the name was changed in 2006. Google Earth was originally known as Earth Viewer and was created by Keyhole, Inc. Google acquired the company and product and rebranded it as Google Earth in 2005.

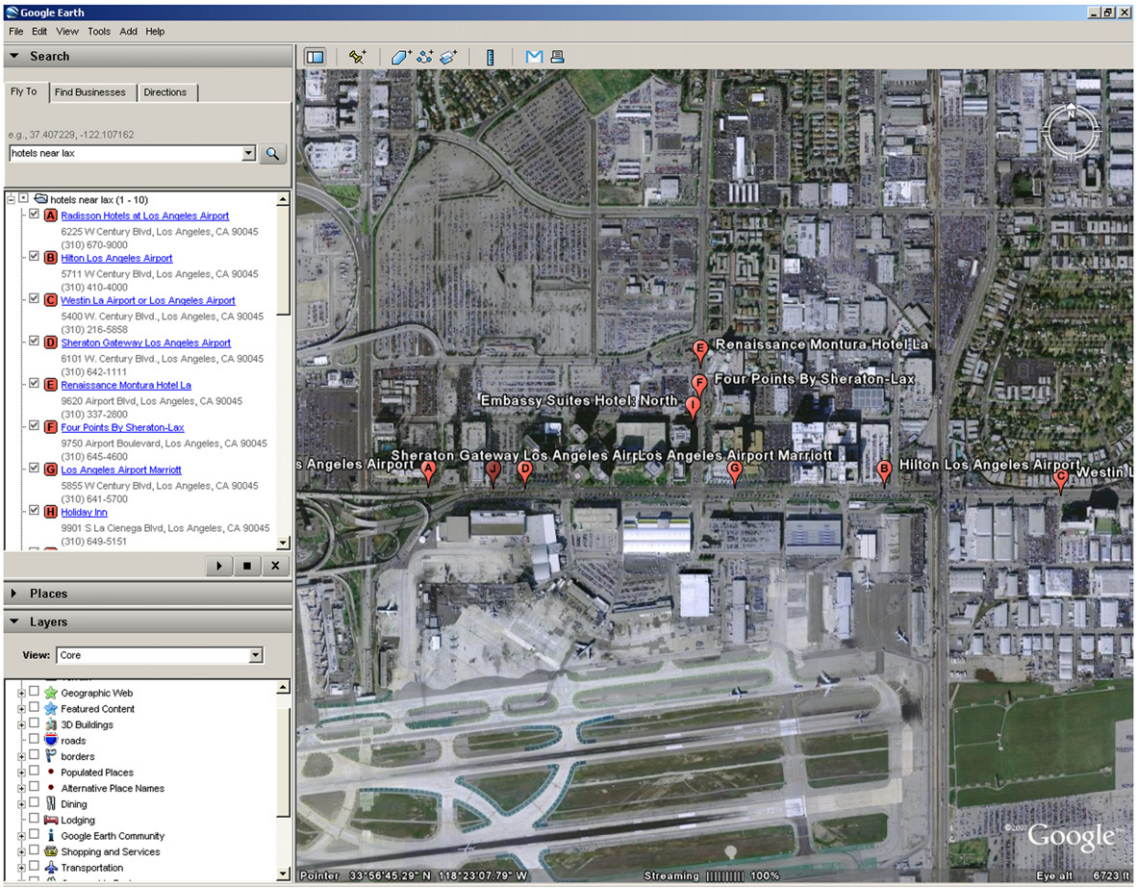

Fig. 2. Examples of Google Maps and Google Earth (Los Angeles Airport). *Source:* Authors' photo on March 23, 2007.

visualizations of material locales (Zook and Graham, 2007). Because DigiPlace is based on the ever changing data, algorithms and relationships that comprise the Internet, it generates an almost infinite blending of code and place.

Although in some respects DigiPlace represents a simple continuation of the power of physical maps to shape interactions and experiences with place (Harley, 1988; Pickles, 2004), it is novel in three important senses. First, visibility in DigiPlace is "automatically produced" (Thrift and French, 2002) by code based on an entity's online presence. Those off the network are summarily relegated to the periphery of DigiPlace, and even those online are subject to the caprice of code. Second, DigiPlace is a highly individualized construction and belies any fixed representation. Finally, DigiPlace greatly increases the dynamism of digital cartographic visualization. Unlike the static representations of physical maps, DigiPlace is constantly evolving based both on the choices of users and the composition of cyberspace and physical places. In short, DigiPlace encompasses the situatedness of individuals balanced between the visible and the invisible, the fixed and the fluid, the space of places and the space of flows, and the blurring of the lines between material place and digital representations of place.

3.1. Automatically produced

The information processing demands of the world (such as Internet search) require that large portions of routine activities take place without human participation. Thrift and French (2002, 309) argue that "more and more of the spaces of everyday life come loaded up with software, lines of code that are installing a new kind of automatically reproduced background" (see also Amin and Thrift, 2002; Thrift, 2004a,b; Graham, 2005) These lines of code almost always perform pre-defined actions in response to pre-defined stimuli. The precise causal links between coded inputs and outputs, however, can often be convoluted and even incomprehensible, particularly to the users of the code (Ullman, 1997).

While the automated production of space generally proceeds as the programmers intended, there are any number of examples where minor coding errors result in unintentional and costly mistakes. For example, a coding error in the conversion of Japanese Yen to US dollars resulted in thousands of people booking luxury hotel rooms in Tokyo for $2 a night (Schulte, 2005). The effects of automated code are rarely this dramatic, but nevertheless remain a fundamental part of the construction and use of space.

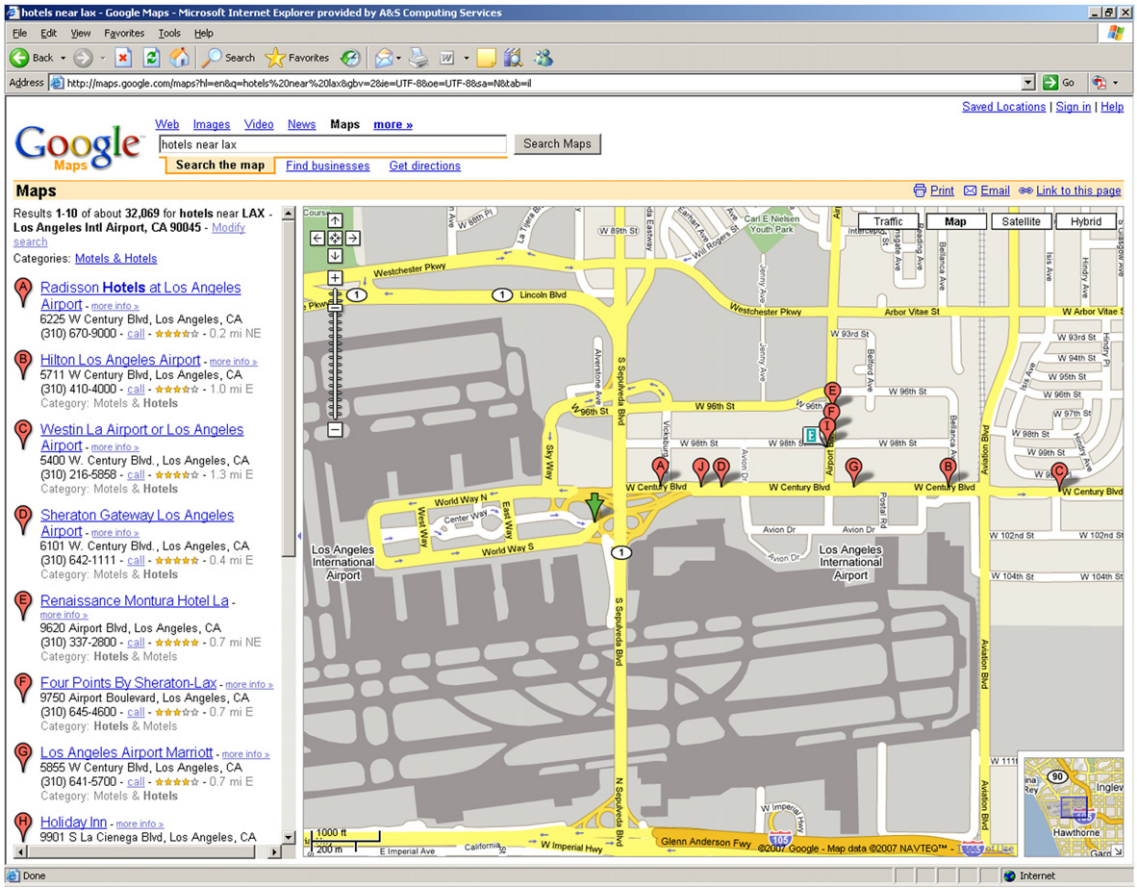

Fig. 2 (*continued*)

The code of DigiPlace requires an online presence in order to be ranked and those without one are switched off (see also Castells, 2001, p. 269–270). Being online, however, is merely a necessary condition for inclusion and does not guarantee a prominent position in DigiPlace. Instead visibility is determined by the largely opaque code of the Google PageRank system. The invisibility of software encourages the perception of coded rules, such as Google Maps results, as natural. The programmed output of effects in response to inputted stimuli, however, adds a heretofore unknown dimension to the ways in which spaces are controlled and power distributed. Thrift and French again note that "power is built into software from its inception. For example, binary code is premised on the Leibnizian conception of permitted/not permitted" (Castells, 2001, p. 325).

Even the act of classification and selection of search terms is not unproblematic. As Bowker and Star (1999, 5) argue, any type of categorization inevitably "... valorizes some point of view and silences another ... and as such it is dangerous." Similar critiques of geodemographics, *i.e.*, applying data associated with an areal unit to individuals living in that area, highlight the power of classification and code and the potential danger of digital models becoming more powerful than the physical reality.

For example, Burrows et al. (2005, 37) assert that the use of Internet Based Neighborhood Information Systems (IBNIS) can "... contribute to ongoing processes of inter-neighborhood segregation and intra-neighborhood homogenization". Similarly, Graham (2005, 563) contends that "code-based technologized environments continuously and invisibly classify, standardize, and demarcate rights, privileges, inclusions, exclusions, and mobilities and normative social judgments across vast, distanciated, domains." In short, the digital data space that contributes to the construction of DigiPlace is always filtered through the power of someone's code and therefore is always vulnerable to overt or surreptitious manipulation (see Fig. 1).

As the rules and rankings of code are automatically produced and naturalized they give rise to and reproduce distinct forms of social, political, and economic power. Such concerns have previously been raised by a number of authors (Eischen, 2003; Graham, 2005; Thrift and French, 2002; Dodge and Kitchin, 2005). To date, however, there remains very little work which attempts to understand how the lived subjective spaces represented by DigiPlace are shaped and governed by the "black boxes that trap software-sorting, and the cultural and spatial politics of code, within their esoteric, largely unknown, and almost completely opaque, technocratic worlds" (Graham, 2005, p. 575).

3.2. Individually conceived

Not only is DigiPlace a hybridization of the virtual and the material, but it is also individualized and non-generalizable.[5] DigiPlace does not exist in any sort of decontextualized and absolute manner but is actualized by the melding of information and locale by individual action. In the case of Google Maps or Google Earth, DigiPlace is created and experienced when a specific query about a location is conducted based on personal needs or interest, *e.g.*, where can I eat lunch? Contexts can be both physical (i.e. the geographical location of a person), technological (*e.g.* the machine(s) used to connect to the virtual), and code based (customized settings and software cookies). Furthermore, possibilities to interact directly with DigiPlace depend heavily on the individual ability of users to access the virtual world. Economic barriers to owning the necessary hardware and access rights, as well as individual cognitive and technical skills, render DigiPlace invisible for many people.

These differences in context and ability mean that DigiPlace is accessed, interacted with, and conceived of in fundamentally different ways by each user. Particularly important is how these differences affect one's cognitive map of a place, *i.e.*, the "representative expression of ... an individual's knowledge about the spatial and environmental relations of geographic space." (Kitchin, 2001, p. 2120). Lynch's (1960) ground-breaking work on the perception and mental maps of the city were necessarily limited to the physical environment, but the advent of DigiPlace means that a whole new layer of virtual inputs can shape one's conception of a physical place. Moreover by facilitating the sharing of spatially referenced annotations (see Figs. 5–10) DigiPlace allows individuals to easily impart their perception of places to others.

While the spaces of DigiPlace are differentially created and interpreted by each person, they are also automatically created by code based on the personal attributes of individuals. Graham (2005) defines this as 'software-sorting,' or a process through which selective access is organized using a "burgeoning array of subscriptions, passwords, service entitlements, physical and virtual access control points, electronically surveilled passage points and transaction systems, automated, biometric judgments, and normative databases – all of which are continuously enacted and sustained through code and computerized systems based on machine-readable inputs" (Graham, 2005, p. 546). Thus, not only does each individual's ability and cognition shape the DigiPlace they inhabit, but their unique code (manifested as a data profile) automatically determines the enclosure of information space in which they operate. In short, DigiPlace represents the situatedness of discrete individuals straddling virtual and physical realities, rather than any sort of shared, objective, and fixed reality.

3.3. Dynamically reconstructed

In addition to varying individually, DigiPlace also is temporally dynamic particularly since electronic architectures can be reconfigured relatively quickly. For example, the Google index underlying Google Maps is updated daily resulting in a continuous reconfiguration of rankings based on the current constellation of links gathered by Google's spidering programs. Moreover, the openness and structure of the Internet means that new material, links and websites are constantly introduced or reconfigured.

In addition, the interlinked nature of the Internet means that changes in one part of the system influence a variety of outcomes in other parts of the system. Such effects are readily evident in the context of Google and its PageRank algorithm. As cultural, economic, and political trends, tastes, interests and processes evolve, those changes ripple through cyberspace and as a consequence, the Google's ranking systems never reach a stable equilibrium. A changed PageRank score for any website results in the alteration of PageRank for every related website. Such exponential effects are constantly being calculated by code and lead to a system of ranking that is far from stable. The fluidity of cyberspace combined with the dynamism inherent to physical spaces (*i.e.* the city is constituted in a different manner today than it was yesterday) (Harvey, 1989; Soja, 1989; Brenner, 1999; Massey, 1999), results in spaces of DigiPlace that are continually re-combined. While this article focuses primarily upon the role of Google's code in the production of DigiPlace, the users of cyberspace also assert power via the construction of their online linkages. In particular, the rise of social networking sites such as FaceBook or MySpace (commonly referred to as Web 2.0) creates new networks of collaboration and cultural production which in turn reshapes PageRank and ultimately DigiPlace.

The satellite imagery deployed within Google Earth is an interesting combination of stasis and dynamism within DigiPlace. The images are static and represent a certain moment in time, but by no means is it the same moment for every location. All images are reported to be three years old or less, but because they are drawn from a wide number of sources it is "... difficult ... to specify the date of a city or region (a single city may have imagery taken from different months)" (Google, 2006d). This temporal diversity is further complicated by ongoing efforts to update and improve images creating a dynamically evolving set of static imagery that varies across space.

Thus, physical places and digital cyberspace combine into a DigiPlace that is conceived as hybrid and experienced instead of essentialized ontological entities. DigiPlace is a way of imagining the interdependencies of physical and virtual places and processes (see for example: Gregory, 1982; Johnston, 1984; Pred, 1984; Massey, 1985,

[5] The individualization evident in DigiPlace follows the trend exemplified by the ongoing evolution of Fordism towards more flexible forms of production and also echoes Castells' (1996) argument that society is increasing structured around "the Net" and "the Self".

1993; Castree, 2003). Thus, Google's DigiPlace is not a permanent or fixed container (*c.f.* Curry, 2005), but is instead subjective and dynamic space shaped by local and extra-local people, places, and processes. This echoes Batty's (1997, p. 340) concern with "... the ways in which ... space inside computers is changing material place outside computers."

In a similar manner, as automatically produced, individually conceived and dynamically reconstructed spaces become more prevalent, the configurations and architectures of DigiPlace begin to have real-world effects. The specific presences and absences in any DigiPlace influence users' geographic cognition and shade users' interactions and use of places. As Harvey (1989, p. 219) argues, "The spaces of representation ... have the potential not only to affect representation of space but also to act as a material productive force with respect to spatial practices." Therefore, it is imperative to consider the effects of any fixing and ranking of knowledge about the physical places that are embodied in DigiPlace.

4. "Fixing" Google's DigiPlace

> "Which lines we draw, how we draw them, the effects they have, and how they change are crucial questions" (Pickles, 2004, p. 3)

Pickles (2004) observes that countless identities have been created by fixing and ordering lines, distinctions, and hierarchies, and in so doing stabilizing one out of many potential meanings. Cartographers (particularly those working for a state) manufacture power, and maps have politics (see also Harley, 1988; Anderson, 1991; Monmonier, 2002). Pickles asserts that cartographic fixings are grounded in modernist needs that required knowledge to be equated with clear and unmediated visual representation. All aspects of the world had to be objectively represented as pictures. So, it is not just physical objects called maps that had the power to stabilize identities, but a larger cartographic imagination (the God's-eye view) that influences the forms of language and thought.

Many other authors also point to the dangers inherent in the fixing of representation due to the fact that analytic categories always carry with them discursive power in their own right (Dicken et al., 2001, p. 90; Scott, 1998). Fixed representations thus translate into actions on the basis of understandings created through those representations (Massey, 2005; Gibson-Graham, 1996). Particularly problematic, is the ability of stasis, representation, and closure of space to remove political possibilities (Massey, 2005).

Such concerns have led to calls for less hierarchical forms of mapping. For example, Pickles asserts: "I hope to show how maps and mapping can be thought in much broader terms and in ways that enable us to open the contemporary meanings of the map for social inquiry" (Pickles, 2004, p. 14). Pickles argues that cartographies should move away from fixed lines which uncritically stabilize particular meanings, and avoid fixed totalizing and monochromatic interpretations of maps which are so closely tied to modernist ways of thinking.

At first blush, Google's index seems to democratize how knowledge is used and accessed in ways that are free from meta-narratives, fixed meanings, and dominant discourses. User determined search terms (filtered through Google's code) return relevant references on the Internet. For example, a search for the word "truth" returns a link to every document connected to the Internet that contains that term (reportedly 384 million documents). While this may initially seem to be another escape from grand narratives (*i.e.* 384 million opinions can be heard), the overwhelming nature of all of those voices necessitates an efficient ranking system which effectively limits the voices that will be accessed.[6] In other words, Google's enclosure and filtering of the Internet determines what is central and what is peripheral on the Internet. In turn, these measures of centrality determine how the virtual and the physical are melded into DigiPlace.

4.1. Re-fixing lines Google style

Information conveyed in Google Maps and Google Earth is much more than just maps consisting of lines and shapes. Google's maps are methods and means of representation, new ways of storing knowledge; they have become a means through which to explore the world, and subsequently help shape a distinct way of seeing and interpreting: an inherently spatial epistemology. The knowledge and information Google Maps and Google Earth convey has both an air of plurality (everyone gets heard) and unfixity (spaces are represented today differently than they were yesterday). In short, they appear close to Pickles' ideal for cartographic inquiry, *i.e.*, Google is the harbinger of a new ways of seeing and thinking. Everyone fixes and unfixes the lines that get drawn, and the results of any search for knowledge are inherently democratic.

This, however, is not (and more importantly, cannot and will never be) the case. This is not to claim that Google is not a step closer to the exploded visualizations which "evoke the vacillating, dispersed and disseminated nature of borders" that Pickles (p. 192) advocates. But, while Google's cartographies of fixed (and unfixed) inscriptions surely come close to the "schizoid," "multiply coded shifting, decentered identities" (p. 180) described by Pickles, it remains that Google's mapping is locked to its code. It always draws some lines and omits others and retains the final authority over what is allowed. The new maps produced through Google may destabilize established meanings, but they will not achieve plurality and unfixity

[6] This point is compounded by the fact that the number of "hits" on a particular search term (or the overall size of its index) is by no means an empirically testable number (Sullivan, 2005) and in any case Google only provides users with the top 1000 ranked websites (Calishain and Dornfest, 2003).

because Google is the creator (and owner) of the code that creates these new representations.

A particularly salient example of the re-fixing of place is the algorithm used by Google Maps in a search for a business near a particular physical location. Results are ranked according to a hybrid measure of relevance which combines Euclidean distance with online popularity. The implications of this hybridization of relevance are that Google Maps will often rank results which are far away from a search location higher than results that are closer. Distance, as defined in Google DigiPlace, is thus not a purely geographic exercise but combines measures of centrality from both the virtual and physical worlds. Businesses without a web presence (beyond a simple listing in an electronic phonebook) could thus run the risk of marginalization as the use of DigiPlace expands.

For example, Fig. 3 illustrates a search on the keyword "abortion" in Lexington, Kentucky. Although this is a likely search term that someone seeking to end a pregnancy would use, it is also a highly contested arena within American culture and politics. The results are a mix of counseling services that encourage women not to have abortions (A, B, D, F, G, H, I and J) and medical facilities providing abortions (C and E). Moreover it appears that many of the anti-abortion results may represent the same organization in material space that has multiple manifestations in cyberspace. For example, results B, F, G, and H share the same street addresses as do results A and I. Also significant is the order in which these results are returned. Despite result A being significantly further away from the Google defined center of Lexington (indicated by the marker with the dot in the center of map) than most other results, it is nevertheless ranked first. It is also the only entity in these results that had any online reviews (visible only via the Google Maps interface) which may be a factor in this placement.

4.2. Automatic production of new centers

Another informative example of Google's ability to destabilize and subsequently fix meaning is the creation of new geographic centers within Google Maps and Google Earth determined apparently haphazardly by the coding demands of the systems. If one begins at the default page for Google Maps and zooms in as far as possible, one arrives at a horse farm outside of Coffeyville, Kansas (Caldenhead, 2006). A similar exercise with Google.co.uk arrives in the downtown of Crewe located in central England, and Google.ca leads to the campus of the University of Winnipeg in Winnipeg, Manitoba. While there is no apparent reason for the selection of these new "centers" found via Google Maps, Caldenhead (2006) reports that

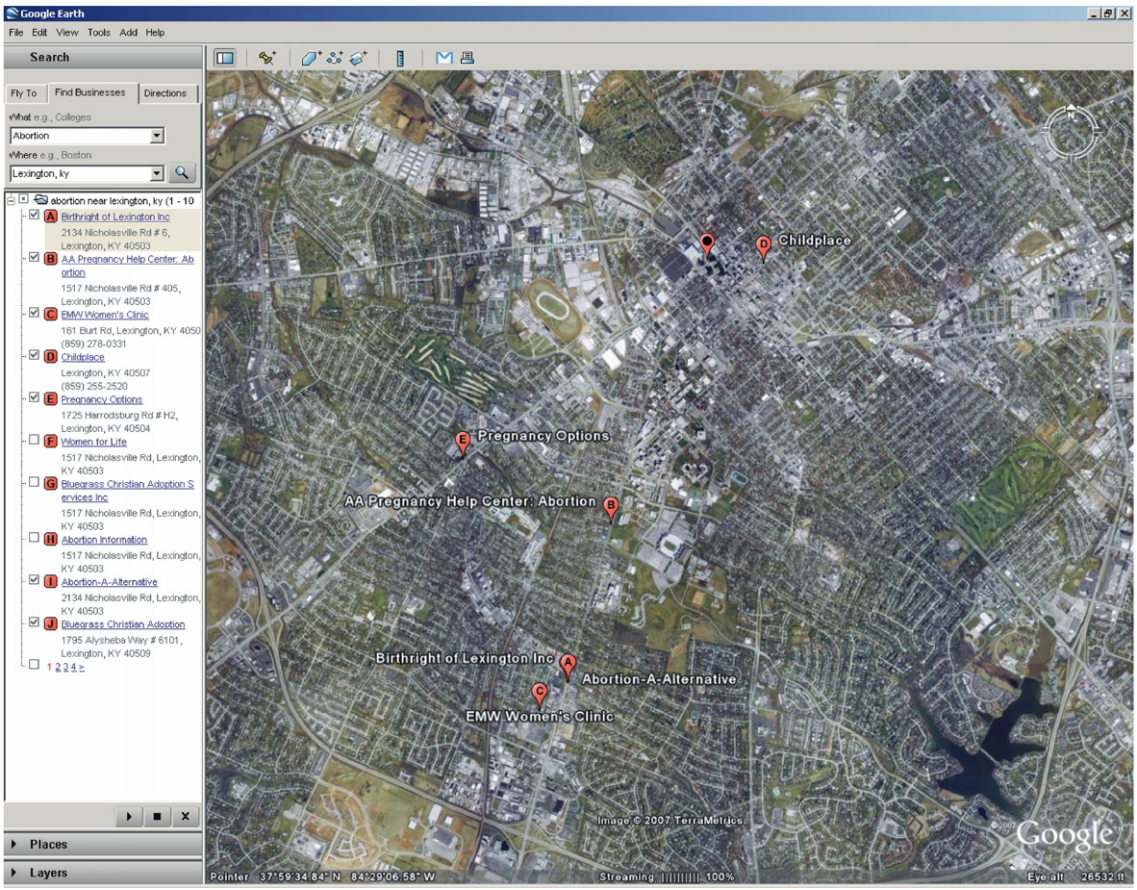

Fig. 3. Search for "Abortion" in Lexington, Kentucky. *Source:* Authors' photo on March 23, 2007.

the default center for Google Earth, Lawrence, Kansas, is because it is the alma mater of a Google executive.[7]

What is particularly interesting about these examples is that these new "centers" were determined completely autonomously by Google rather than through some international discussion or treaty (as was the case for the determination of the prime meridian). Moreover, the need for a center is driven by requirements of the code underlying the system for some kind of default starting position. While these centers may not endure, it is entirely plausible that they will remain simply because of the lack of a compelling need or interest in change, or potentially some kind of "lock-in" via other software designed around it that discourages change. Regardless, it is an illustrative example of how code in general can drive representation and how Google's code specifically is "fixing" DigiPlace.

Therefore, Google's DigiPlace falls short of the contested and emancipatory cartography envisioned by Pickles. While successfully destabilizing some lines and meanings, it has in turn created new sets in their place. While potentially liberating, these new spaces are colored by the fundamentally undemocratic and private nature of this DigiPlace. Rather than open and public space, Google (via code or policy) determines what is seen and what is obscured.

5. Constructing a privatized Google DigiPlace

> "There has never been a time in history when more of our "culture" was as "owned" as it is now. And yet there has never been a time when the concentration of power to control the uses of culture has been as unquestioningly accepted as it is now." (Lessig, 2004, p. 28)

Although Google famously notes that "you can make money without being evil" (Google, 2006b), increasingly strong criticisms have been directed towards the company's policies (Timms, 2006; Meyer, 2006; Watts, 2006). What is lacking in these critiques, however, is an analysis of the implications of Google becoming a part of the daily lived geographies of its users via DigiPlace and how this fixes representations of space. Central to this concern is Google's ability to control what information is included (or excluded) in its maps, how it is ranked and how individuals are able to interact with and append to it. This section considers how the private and commercially driven background of Google Maps and Google Earth is shaping DigiPlace.

5.1. Increased and geo-coded visibility for individuals

While DigiPlace is individually created via a person's queries, it is also automatically produced by code based on the personal attributes of individuals. Just as Google Maps have engendered new types of visibility to urban amenities, it has also made individuals more visible. In large part this is driven by its stated mission, "to organize the world's information and make it universally accessible and useful" (Google, 2006e), that inclines Google towards indexing all data to maintain its dominant status. This is turn is pushed by the need of a for-profit corporation to meet stockholder's quarterly expectations.

Graham (2005) is concerned with the phenomenon of "software-sorting" deployed by businesses and governments that impacts privacy. But a more prosaic example is the ease with which phone numbers can be mapped. The main Google search engine allows one to conduct a "reverse phonebook search" (locating the address of a phone number) that gives rise to obvious privacy and safety concerns.[8] These privacy concerns did not begin with Google, nor are they limited to Google's technology. They have existed since the general availability of reverse phone number lookups (Bass, 2004; Hurwitz, 2005; Wong, 2003). Commentators, however, voice concern over the combination of instant access to personal information with maps and driving directions via Google's mapping services and the implications for privacy (McUsic, 2005).[9]

Google recognizes the privacy and security concerns of this search function, and have implemented an option that allows users to opt-out of the listings. This opt-out option does not, however, appear to be widely used. An analysis on the phone numbers of 1003 individuals with the surname "Smith" in Lexington, Kentucky revealed that Google was able to provide names and addresses for 97% of this population. This high success rate suggests that the availability of the opt-out feature has done little to curtail the availability of what was once generally considered private (or at least difficult to obtain) information.

5.2. Democratic DigiPlace versus corporate control

Although Google argues that "Democracy on the web works" (Google, 2006b), and declares that PageRanks "determine which sites have been 'voted' the best sources of information by those most interested in the information,"

[7] Equally interesting is that Google Earth displays the prime meridian 100 m to the east of the official site, the Greenwich Observatory. While this placement is due to differences between the grid established by surveying and the WGS84 grid used by GPS systems (rather than Google's action), the ability to easily access Google Earth has turned a bit of cartographic trivia into a public news story (Haines, 2006).

[8] This feature, however, is only available in some countries.

[9] Although Google is aware of the privacy issues its indexing raises, its interest in amassing data means that it is reluctant to remove any data from its index. This, however, has lead to an ironically inconsistent stance on how its index impact privacy. An article in which a journalist used Google to see how much personal information she could find out about Google's CEO (including his home address), resulted in a quick and scathing response from Google, including banning any further interaction with the reporter and her media outlet (Stross, 2005).

it is clear that its rankings are susceptible to manipulation. While the Tiananmen example in Fig. 1 shows this in terms of data indexing, the common example given for Google Maps, *i.e.*, searching for pizza near a specific location, illustrates the evolving ranking system for geo-referenced data (see Fig. 4). When a search for pizza in Lexington, Kentucky was conducted in August 2005, it appeared that a key factor was the number of hyperlinks to an establishment's webpage rather than the overall size of a firm. This example aptly demonstrates how local (and popular) pizza shops were highly ranked because of the large number of external links (via reviews and guide websites) they had. This seems to validate Google's claim of a democratic "vote" determining the order in which businesses were displayed. Establishments with loyal (and local) followings were at the top.

This ordering, however, has undergone a decided shift; all locally owned restaurants, bar one, had been replaced in the results of a Google Maps search by national chains by June 2006. The Google algorithms are famous for giving people what they are looking for, but the rankings have changes unidirectionally in the favor of large companies. Moreover this is not an isolated event. The same pattern appears in searches for "pizza" in Indianapolis, IN, Atlanta, GA, Charlotte, NC and Albany, NY. Despite its "do no evil" motto, Google has already shown itself capable of manipulating its code in response to commercial pressures, *i.e.*, the ability to do business in China. And the example in Fig. 4 raises concern that a similar process is unfolding spatially. Although it is unknown whether these patterns are due to Google's code or others' attempts to manipulate this code, the democratic effect so proudly

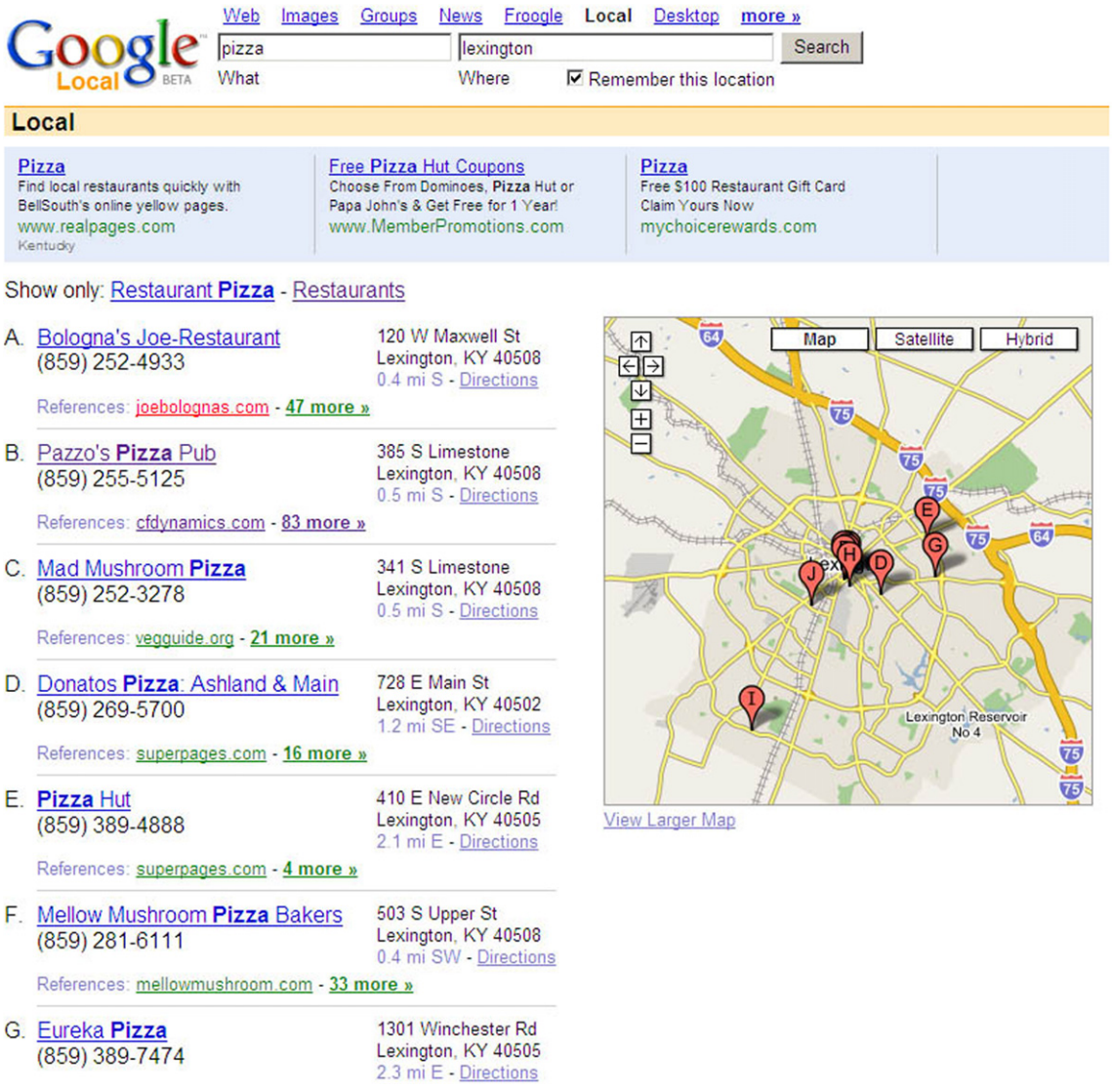

Fig. 4. Search for "Pizza" in Lexington, Kentucky. This figure uses Google Maps because Google Earth images were not captured by the authors originally and the constantly changing nature of Google's index makes it impossible to replicate historical searches. *Source:* Authors' photo on August 2, 2005 and June 4, 2006.

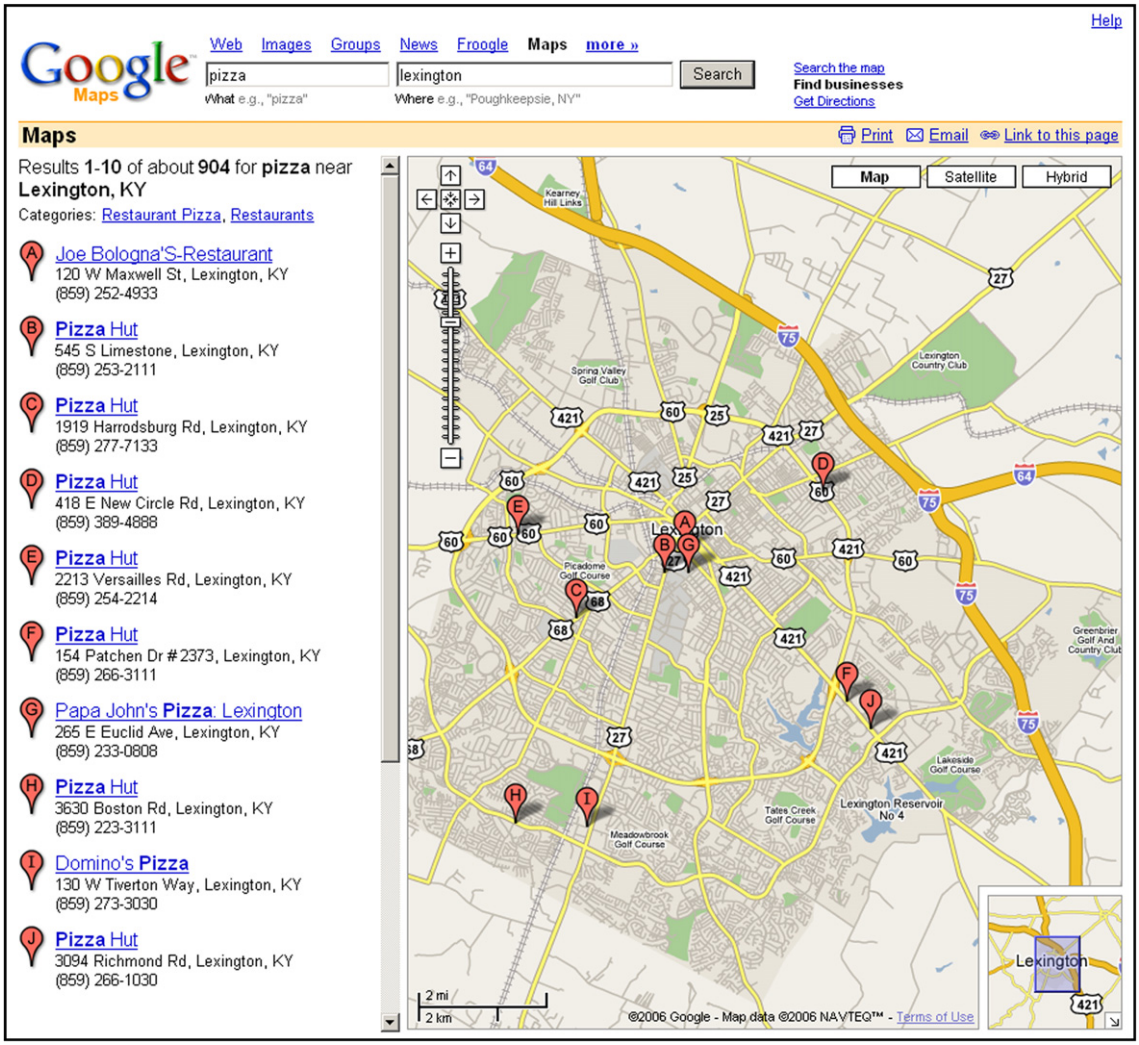

Fig. 4 (*continued*)

voiced by Google may be evolving into something else.[10] Google Maps is an innovative and useful service, but it is profoundly worrisome that a for-profit corporate entity is acting as the gatekeeper to the unfixing of lines and contestation of meaning. While the usefulness of the Google interface cannot be denied, it is an enclosure of the Internet and will remain fundamentally undemocratic as long as the code is maintained within privatized black boxes and policies are determined by corporate managers rather than a well-informed citizenry. Despite its rhetoric to the contrary, Google governance does not necessarily correlate with a democratic DigiPlace.

5.3. Free speech in a private DigiPlace

A key aspect of Google enabled DigiPlace is the ability to add annotations (referred to as placemarks) containing text, hyperlinks, or photographs within Google Earth. These placemarks can either be individually and locally stored (in a similar manner to one's list of bookmarks in an Internet browser) or can be shared worldwide through the Google Earth Community layer. Placemarks include historical narratives, short vignettes, and information about a material place. These placemarks often precipitate comments and debates from other users within the associated forum.

Placemarks are one of the most obvious illustrations of how information in virtual space can affect perceptions of physical places. For example, Fig. 5 displays a placemark in Santiago, Chile documenting a site used for torture during the Pinochet era. This is but one of hundreds scattered throughout Chile placed by human rights activists as a digital memorial to the victims of this time. While it is possible (even highly likely) that people use these material places

[10] Although it is beyond the scope of this article, the debate surrounding the issue of "network neutrality", *i.e.*, the fear that large broadband suppliers such as AT& T will charge tolls to content providers to prioritize access to their websites, shows that there are accessibility issues that extend beyond Google's indexing system (see Manjoo, 2006). Indeed, there seems a real issue with the "leveling effect" of the Internet. While rarely as empowering as some pundits declared, it does seem to be cause for worry.

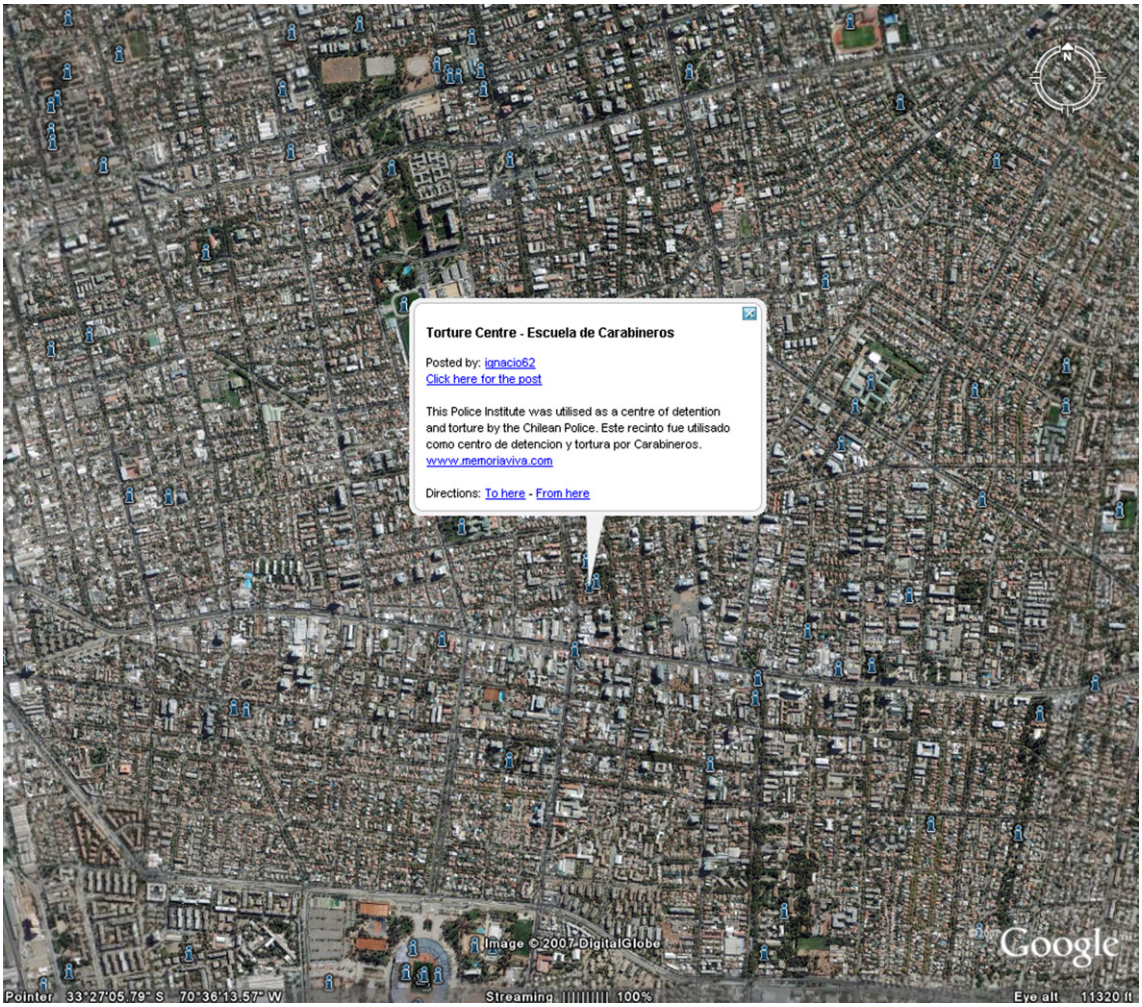

Fig. 5. Placemark in Santiago Chile. *Source:* Authors' photo on March 23, 2007; Text reads "The Police Institute was utilised as a center of detention and torture by the Chilean Police. Este recinto fue utilisado como centro de detencion y tortura utilisado por Carabineros. www.memoriaviva.com".

unaware of these placemarks, DigiPlace can shape the perception of those who access this digitized layer of the human landscape.

The ability to make and share placemarks turns on participating in the Google Earth Community bulletin board (http://bbs.keyhole.com/) which provides a forum for technical questions and sharing placemarks. Membership is freely available to anyone, and posting a placemark in one of the forums, *e.g.*, as the author of the placemark in Fig. 5 did, ensures that one's annotations are available to all Google Earth users. These placemarks show up in the Google Earth Community layer (manifesting as a blue "i" within Google Earth) and can be turned on or off as a user desires. Lively online discussions about placemarks range from semi-academic conversations about the locations and names of airport codes,[11] and the names and hometowns of military causalities of the Iraq war,[12] to more frivolous communication themes such as crop circles[13] and filming locations from the Lord of the Rings movies.[14]

The DigiPlace generated by these placemarks is in many ways open, unfixed, and democratic: a many to many complex system much like physical space. There is, however, a bureaucratic code (*i.e.*, rules) established by Google that govern what is seen and who is heard. According to the official FAQ there are only four regulations which govern the entire system: participants must not (1) break any copyright laws, (2) post personal contact information, (3) transmit commercial messages, or (4) "post any material likely to cause offense" (Google, 2006a). The FAQ also notes that any message or placemark can be edited or censored at the discretion of the moderators.

An additional posting by Lrae (2006), an administrator of Google Earth, outlines a specific list of Do's and Not Do's including a prohibition on posting of all "Political,

[11] http://bbs.keyhole.com/ubb/showflat.php?Cat=0&Number=168950.
[12] http://bbs.keyhole.com/ubb/showflat.php?Cat=0&Number=178100.
[13] http://bbs.keyhole.com/ubb/showflat.php/Cat/0/Number/175202.
[14] http://bbs.keyhole.com/ubb/showflat.php/Cat/0/Number/69500/an//page//vc/1.

Fig. 6. Placemark in Jenin, West Bank. *Source:* Authors' photo on March 23, 2007; Text reads "clear erea [sic] in the middle of jenin destroyed by Israeli troops and killed 5000 people on 2003 the UN described this as a war crime ...".

Religious, Racial, or Sexual material". These rules are no doubt partially an effort to limit the administrative headaches for Google Earth that offensive or controversial placemarks would create. As a result, however, Google Earth differs fundamentally from the governance (or lack thereof) associated with the public Internet. Google Earth is a private space in which users are welcome to participate as they see fit, but ultimately the power of governance lies with Google.

As a result, the enforcement of Google Earth's rules is somewhat erratic. For example, one Google Earth user posted his own survey of the electric transmission grid in Tampa, FL to Google Earth and reported having his account canceled and his data removed because Google Earth received a "... very aggressive response from the Tampa Electric Power Corporation who asserted that the colors used and information presented show that the placemark was derived from controlled internal data and was therefore a breach of serious security for it to be out in the public." (timl2k6, 2006). Later postings by other users discredited this corporation's contention, noting that this "secret" data was available for purchase. Whether this removal was due to actual security concerns or Google's desire to avoid legal suits or justifiable copyright issues is unknown. The overlay nevertheless remained removed, illustrating the limits to publishing placemarks within Google Earth.

At the same time there are numerous examples that violate the prohibitions outlined in the FAQ and refined by Lrae (2006), particularly those regarding commercial postings. It is relatively easy to find placemarks recommending vacation hotels or identifying locations where prostitutes are available (*e.g.*, specific locations and businesses within Bangkok and Amsterdam). In short, many placemarks which run counter to the stated Google Earth rules are readily available through the community layer without censure. It is impossible to determine whether this represents selective (or lax) enforcement on the part of Google Earth administrators or is the result of the inherent difficulty in enforcing a code based on human judgment (versus the algorithmically determined PageRank) on what is to be allowed and what is to be prohibited.

A particularly subjective area is the rule against posting "political" materials. What one individual considers to be

Fig. 7. Placemark for Bomb Crater on a Runway at the Al Asad Airbase in Iraq. *Source:* Authors' photo on March 23, 2007; Text reads "Nise [sic] Shot! hahahahaha america kicks ass!".

highly political, *e.g.*, directions to abortion services, may seem to another simply a basic informational service (*c.f.* Fig. 3). The example presented in Fig. 5 is both a memorial to victims of torture, but also a profoundly political act which condemns the actions of a regime that enjoyed the staunch support and protection of the United States' government. Moreover, the presence of these digital markers in the Santiago urban environment are not simply neutral footnotes but an addition to the ongoing debate on the history and politics of Chile (Fig. 6).

Another enlightening case (a listing of 700 villages that Palestinians fled after the 1948 Arab-Israeli war) highlights the power of maps and markers in naming and laying claim to physical places.[15] While the placemarks contain only village names and historical population figures, clicking on one of them also provides a link to an advocacy and online community group for the displaced Palestinian population. Although not explicitly political, the locating of these villages in this conflict over land and occupation rights, can easily be interpreted as a political statement of Palestinian rights to places within the state of Israel (see Shoffman, 2007). Likewise a placemark within the Jenin Refugee camp in the West Bank (Fig. 7) documents the site of destroyed houses and further asserts that Israeli troops "killed 5000 people"; an assertion contradicted by U.N. investigations into this event. Yet these placemarks have been incorporated within the Google Earth Community layer.

Overtly political placemarks are also evident in locations that are the site of ongoing strife. Fig. 7 shows a placemark next to a bomb crater on a runway in Iraq, with the accompanying text "hahahahaha america kicks ass!". The individual posting this placemark was celebrating the US's military power in Iraq; one of the most contentious issues in the world today, yet the link was included within Google Earth Community layer. Representing an alternative view,

[15] http://bbs.keyhole.com/ubb/showflat.php/Cat/0/Number/310630/an//page//vc/1. A related set of placemarks provides the location (along with photos and other documentation) of Israeli settlements in the West Bank http://bbs.keyhole.com/ubb/showflat.php?Cat=&Board=EarthPeople&Number=588272.

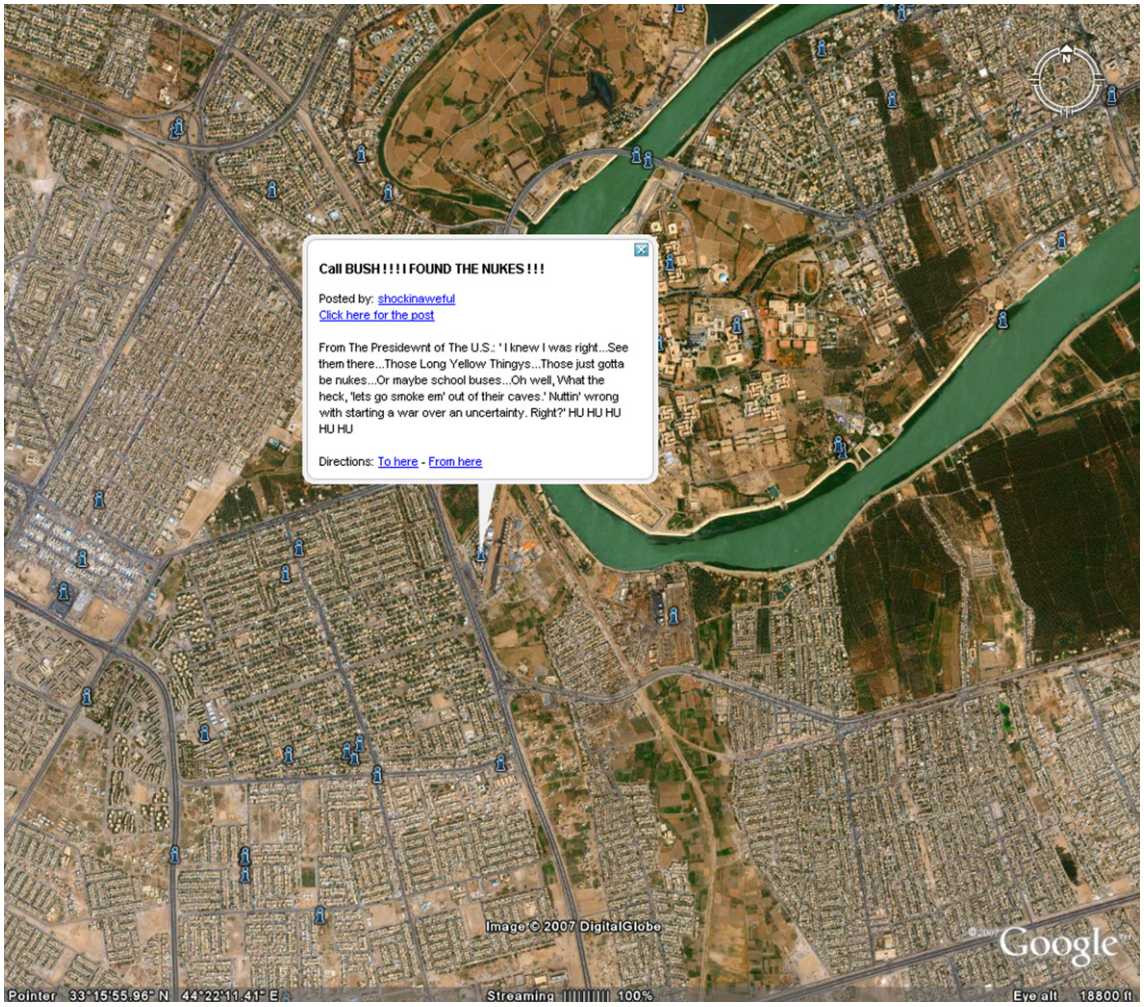

Fig. 8. Placemark in Baghdad, Iraq. *Source:* Authors' photo on March 23, 2007; Text reads "Call Bush!!!! I Found the Nukes!!! From The Presidewnt of The US: 'I knew I was right . . . See them there . . . Those Long Yellow Thingys . . . Those just gotta be nukes . . . Or maybe school buses . . . Oh well, What the heck, 'lets go smoke em' out of their caves. 'Nuttin' wrong with starting a war over an uncertainty. Right?' HU HU HU HU HU".

Fig. 8 illustrates a placemark in Baghdad jokingly declaring to have "found the Nukes!!!" and goes on disparage President Bush with the statement, "Nuttin' wrong with starting a war over an uncertainty. Right?". Regardless of one's feelings towards Iraq, the placemarks in Figs. 7 and 8 represent strong political discourse (albeit sophomoric) within the placemarks of the Google Earth community.

The DigiPlace created by melding material place and digital placemarks can be particularly intense on sites charged with symbolic value in ongoing political conflicts such as highlighted in Fig. 9. The example of an uninhabited mountainside in Cyprus is a case in point. After the 1974 conflict which left the island divided between the Turkish Cypriot controlled north and the Greek Cypriot controlled South, a Turkish flag was painted on a highly visible location as an assertion of power (see Fig. 9). In Google Earth dueling placemarks have been placed next to this flag to assert conflicting positions on the Cyprus division. The western one is more neutral in tone and states, "The turks invaded Cyprus in 1974 and still hold nearly 40% of its north side." The eastern one is much more polemic and argues "This Flag makes us happy and our enemies [sic] scared when they seen [sic] it." The politics surrounding Cyprus are complex (particularly for an outside observer, as most of the Google Earth administrators are) but the second placemark is a strident political stance, and Turkish Cypriots would no doubt demand that the first placemark's characterization of "turks invaded Cyprus" be placed in context of an earlier Greek Cypriot coup.

Thus in practice, the rules governing political placemarks laid down by Google Earth exhibit a pattern of arbitrary enforcement. It is this inconsistency which is worrisome. While understandable that Google Earth would want to avoid placemark flame wars potentially littering disputed DigiPlace material places, the decision to remove a placemark ultimately comes down to human judgment on "offensive" or "political". These judgments are formed both by the community of Google Earth users

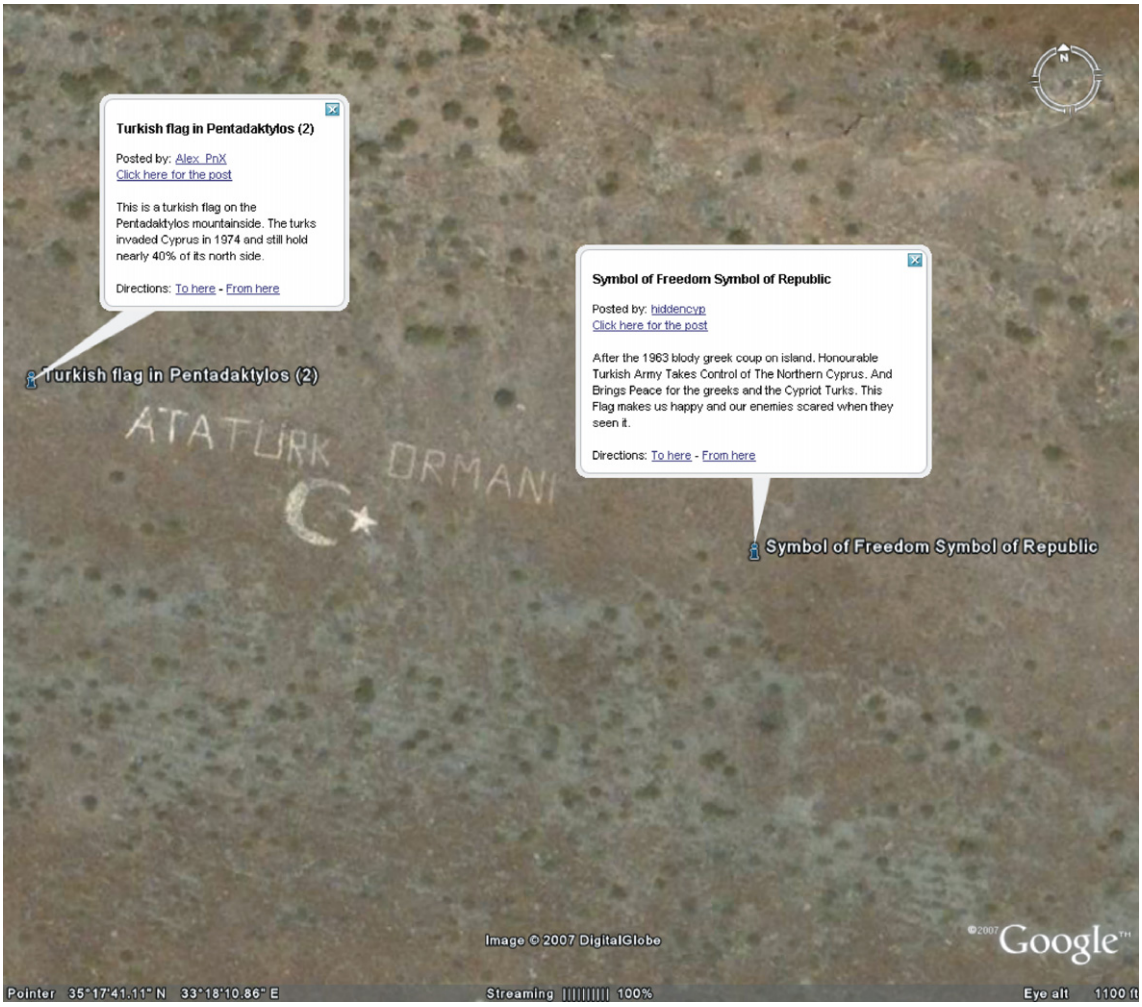

Fig. 9. Placemarks in Pentadaktylos Mountains, Cyprus. *Source:* Authors' photo on March 23, 2007; (a) Text reads "This is a turkish flag on the Pentadaktylos mountainside. The turks invaded Cyprus in 1974 and still hold nearly 40% of its north side."; (b) Text reads "After the 1963 blody greek coup on island. Honourable Turkish Army Takes Control of The Northern Cyprus. And Brings Peace for the greeks and the Cypriot Turks. This Flag makes us happy and our enemies scared when they seen it.".

(largely Western in background)[16] who can report placemarks but, more importantly, by Google Earth administrators who possess the power to police. In reality, the algorithmic code of Google Earth is intertwined with a human code of oversight.

Questions of what is political or offensive cannot be determined automatically, but must rely upon normative values. This raises an important contradiction for Google which boasts about and relies upon the rationality of its code to operate, yet ultimately cannot escape explicit human subjectivity. This reliance was formally institutionalized within the Google Earth Community in March 2007 with the introduction of new forums. These mirror the original forums in which anyone could list placemarks but differ in that only moderators or administrators have the right to post there.

In characteristic Google-style the significance of this shift is downplayed, "We are not saying these [placemarks] represent only the best, but we are saying we learned something about the Earth, its places, its people, or things upon it, from the posts we move." (Lrae, 2007) In short, these forums represent a selective index of Google Earth placemarks constituted by human judgment rather than algorithmic code.

5.4. Censored images of DigiPlace

Speech in Google Earth's DigiPlace, however, is not simply about what one can say with a placemark, but also includes what one is able to see in the program. Google Earth users have documented numerous instances where locations have been deliberately blurred, such as petroleum terminals, corporate campuses, electrical substations, power plants, water treatment plants, prisons,

[16] An ongoing survey of Google Earth users ($n = 7447$) reveals that on March 21, 2007 80% of users are located in the US, Western Europe or Australia. http://bbs.keyhole.com/ubb/showflat.php/Cat/0/Number/12390/page/0/fpart/1/vc/1.

Fig. 10. A partially blurred image of Palisades Center Mall in West Nyack, NY. *Source:* Authors' photo on March 23, 2007.

dams, shopping malls, bridges, highway interchanges and various unidentifiable sites (PriceCollins, 2006).

Fig. 10 shows the building and parking lot of a shopping mall whose intentional blurring is readily apparent when compared to the higher definition areas immediately adjacent to it. Google argues that it relies upon data from other entities who blur imagery according to state ordered security requirements (in the case of Fig. 10 it is the New York State GIS clearinghouse) and therefore is not accountable for this censorship. But Google Earth Community member PriceCollins (2006) notes, "We look to Google for the quality of the output, no matter how or where they obtain the data ... one does not receive bad food from a restaurant, and then let the owner tell you to see the farmer if you are dissatisfied."

Moreover, Google responds to governmental complaints differently, continuing to provide imagery of areas considered "sensitive" by the South Korean government (Card, 2006), entering into discussions with the Indian government about its request for blurring of some areas (Chatterjee, 2007) and apparently replacing newer imagery with older imagery in Basra, Iraq in response to reports that Iraqi insurgents were relying upon Google Earth maps to plan attacks (Harding, 2007; Geens, 2007).

These efforts by national states to censor imagery (before or after they are incorporated into Google Earth) do not go unnoticed or unchallenged by users. Contrasting with the closed and highly secretive system of map making from earlier centuries (Harley, 1988), the censorship in the imagery used by Google Earth is highlighted, compared to other sources of aerial imagery, and actively debated within the Google Earth Community bulletin board and other Internet sites (PriceCollins, 2006; Geens, 2007). Ironically, the efforts to censor the images of physical places casts increased attention on exactly these areas and generates an almost fanatical desire to "expose" the true picture of these places. This does not mean, however, that Google Earth will become free of blurred or obscured areas – be it due to image suppliers' or Google's actions – merely that these areas will be noted and actively debated by its users.

Thus, while Google Earth provides a forum which, in theory, allows for open and destabilized cartographies, community mapping, and unfixed representations, in practice the use of these spaces of DigiPlace are constrained in

multiple ways. These constraints grow increasingly troublesome when one considers the myriad ways in which spatial knowledge can influence political and economic decision making. Perceptions of restaurants in Lexington, Kentucky or neighborhoods in Santiago, Chile, are no longer based simply on an individual's sensory experiences or cognitive map. They are also based on the geo-referenced information one chooses to look at and, more importantly, have been allowed to look at, in Google Earth.

As access to such information moves increasingly from the desktop to mobile devices, the effects of censorship affect our real-time understanding of the spaces within which we operate. The Internet evolved into what it did because it had very few rules about what one could do or say. As a result it engendered a flowering of experimentation and innovation. In contrast, Google Earth is a private space in which user behavior is regulated and proscribed by corporate policy.

6. Creatively reconstructing the internet

> "... the competition from ... the new technology ... strikes not at the margins of the profits, and the outputs of existing firms, but at their very lives. This kind of competition is as much more effective than the other as a bombardment is in comparison with forcing a door ..." (Schumpeter, 1950, p. 84)

The creativity and entrepreneurship surrounding the Internet highlights the power of Schumpeterian "creative destruction" in capitalist economies (Zook, 2005). Despite a relatively late start in the indexing of the Internet, Google and its PageRank code has "destroyed" earlier ways of searching and accessing information. Moreover Google shows no sign of dampening its ambitions. According to internal presentations to analysts, the company envisions the future "as 'a world with infinite storage, bandwidth and CPU power' ... a world where Google 'get[s] all the world's information ... and make it accessible from anywhere (any device, any platform, etc.)'." (Schofield, 2006).

Of particular interest to geographers is Google's coding and enclosing of spatial information and how this information mixes with our cognition of places via DigiPlace. In this article we are arguing that Google's codes and ambitions represent a fundamental reconstruction and reordering of Internet information. Similar to Vaidhyanathan's (2005) argument that Google's provision of indexing and access services does not mean the company has become a library (to make such a claim ignores "all that libraries mean to the lives of their users"), this article argues that Google's DigiPlace has not become a digital version of free and democratic public space. Instead, Google has created a privatized DigiPlace that is well on its way to be becoming the *de facto* digital globe, despite subjective rules that are inconsistently enforced and without clear means of appealing decisions. Moreover, because the DigiPlace of Google Maps and Google Earth depends upon the automatic ranking and creation of space by the PageRank code, an essential actor in creating our future experience of place, *i.e.*, code, remains obscured.

The goal of this analysis is to explore and perhaps even open up, the black boxes which shape and influence the spatial politics of the spaces of DigiPlace. Future research will be able to use this article as a base to explore detailed questions about the relationships between DigiPlace and mapping, privacy, control, and free speech. As Graham (2005, 575) notes, "software-sorting practices must become transparent if we are to evaluate critically the politics of mobility ..., inequality, citizenship, the city, and the body." Simply justifying the sorting of content as the outcome of 'natural' algorithms shuts down any discussion about who is, and should be, seen and heard.

We have begun to develop an understanding of ways in which DigiPlace is formed, but there remains much to be done in understanding how new lived spaces are influenced by the intersections between culture, code, and place. Hess and Ostrom (2006) ask "Who should govern the Internet?" Our fear is that the private nature of emerging DigiPlaces such as Google Maps and Google Earth will render this question largely moot before it can even be debated.

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